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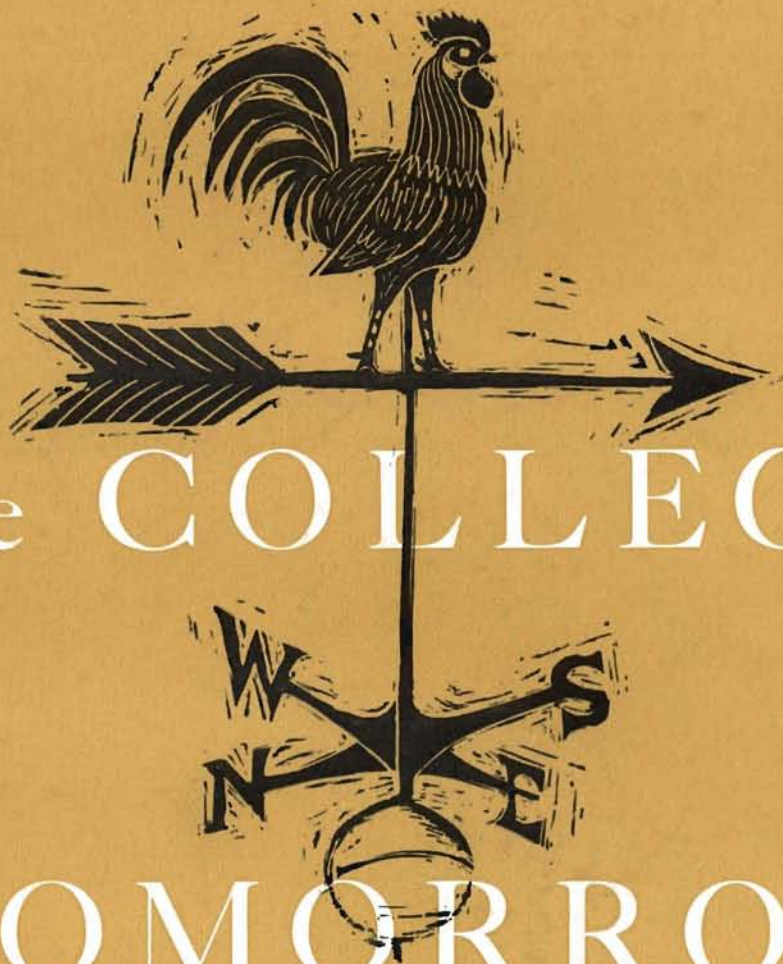
APRIL 1962

WASHINGTON UNIVERSITY

W

Magazine

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the COLLEGE
of
TOMORROW

*At a press conference in the
Chancellor's office, Founders Day
guests met with newspaper, radio,
and television reporters. From left:
Chancellor Tolman; Senator Stuart
Symington; James E. Webb, head
of the National Aeronautics and
Space Administration; and Cmdr.
Alan B. Shepard, America's
first astronaut.*





A NEW CHANCELLOR

On July 1, Thomas Hopkinson Eliot will become the twelfth chancellor of Washington University.

ON APRIL 13, IT WAS ANNOUNCED that Thomas Hopkinson Eliot, vice chancellor and dean of faculties, will become chancellor of Washington University. He will take office on July 1, succeeding Carl Tolman, who reaches retirement age this spring.

As the twelfth chancellor in the University's history, Mr. Eliot will be directing the destinies of this institution in the years ahead. On the foundations he lays down will be built the "college of tomorrow" at Washington University.

The general reaction to Mr. Eliot's appointment can perhaps best be summed up in the words of the St. Louis Globe-Democrat in an editorial on the day the news broke:

"Tom Eliot's experience in law, government, university life, politics, and just plain contacts with people makes him uniquely qualified to be one of the greatest chancellors in the century-old tradition of a great university."

At the time of his appointment, Mr. Eliot made a statement to the press, giving his picture of the job ahead and of the future of the university he will lead. On the following page is the complete text of Mr. Eliot's statement.

IT IS A GREAT PRIVILEGE to be given the chance to lead in the effort to make a good university into a still finer one.

The inspiration of Arthur Compton, and the unstinted devotion of Ethan Shepley, have helped to bring Washington University toward the forefront of the private independent institutions of higher learning in the United States. In the last year, Carl Tolman has done a remarkable job of maintaining our momentum on the educational front.

That momentum will continue. I am not for any great expansion in size, but I am for continuing improvement in the quality of the education that we offer. In national reputation, the rest of the University in recent years has begun to approach the renown which was earned long ago by the Medical School. My hope is that we will be, not just better known, but known as a University where promising students, excellent teachers, and distinguished scientists and scholars together will make a major contribution to the life and learning of the country.

I am happy to take this position in the knowledge that these goals are heartily shared by the University's Board of Directors, and by its faculty.

Thomas H. Eliot

April 13, 1962

WASHINGTON UNIVERSITY *Magazine*

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APRIL 1962

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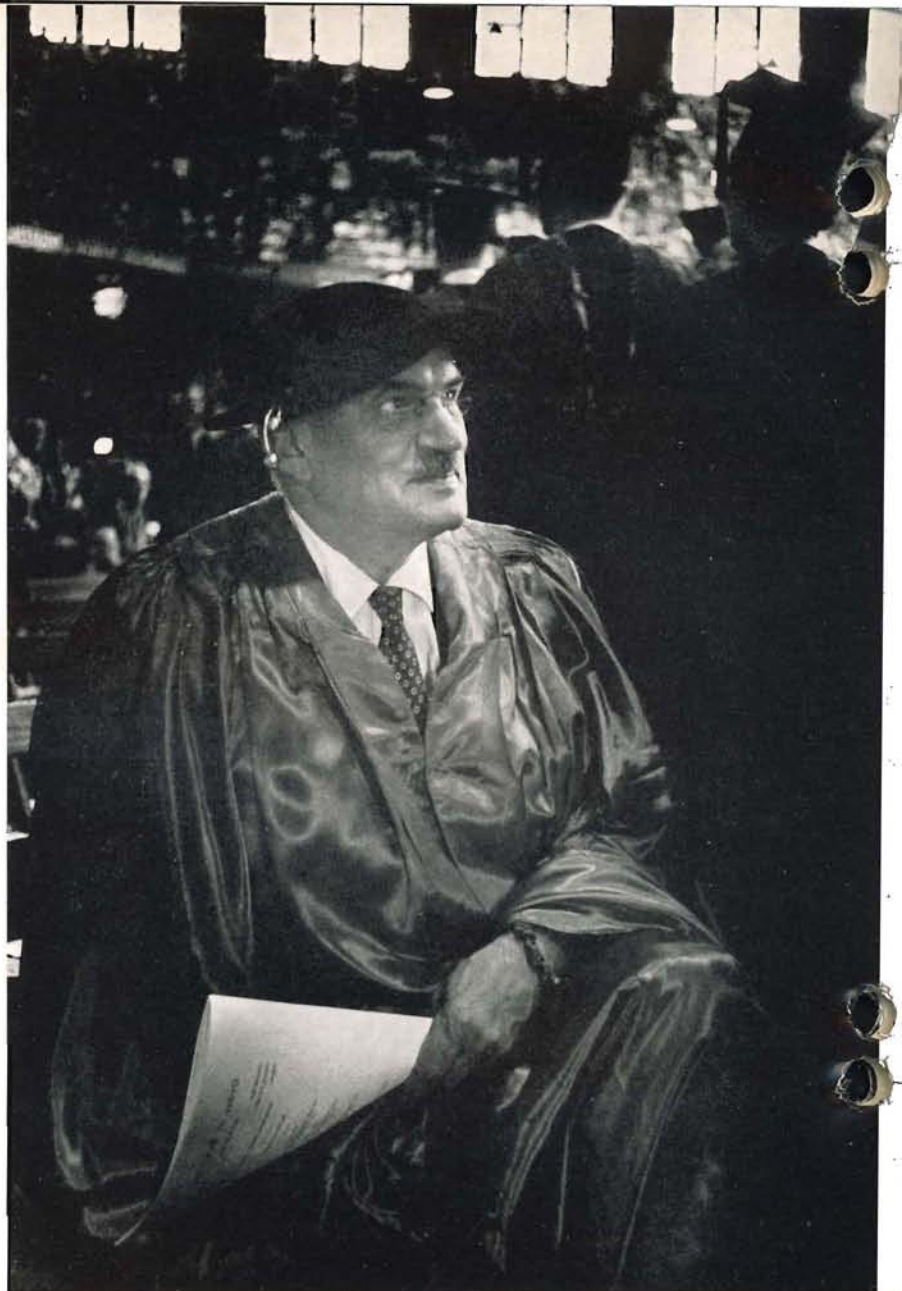
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At Wooster College, where he received his bachelor's degree in 1913, young Arthur earned letters in football, basketball, and track.



Wearing the black beret and scarlet robe of his honorary degrees from the Universities of Aligarh and Punjab, Dr. Compton is caught in a pensive mood at the 1959 Commencement exercises.

*Copy in A.S.
Compton's file*



This portrait of the Compton family was made in 1908. From left: Arthur, Mary, Mrs. Compton, Wilson, Mr. Compton, and Karl. Karl later became president of the Massachusetts Institute of Technology, Wilson of the State College of Washington. Mary married C. Herbert Rice, who served as head of Foreman Christian College and president of Allahabad University in India.

ARTHUR HOLLY COMPTON

Captured in the photographs on these pages are a few moments in the long and illustrious career of Arthur Holly Compton, whose recent death was mourned by the entire University community.

In these pictures, Dr. Compton is shown in a wide variety of roles: research scientist, teacher, scholar, Nobel Prize winner, famous son of a famous family, key member of the team that developed the atomic bomb, banjo virtuoso.

Arthur Holly Compton served the University in many capacities over a span of more than 40 years, first as chairman of the Department of Physics, then as one of the great chancellors in University history, and finally as distinguished professor of natural philosophy and as professor-at-large.

In the words of Chancellor Carl Tolman, "He was our most eminent colleague."



Copies of pictures in A.H. Compton box



Two views of the 1927 Nobel Prize medal awarded to Dr. Compton for his research into the nature of X-rays. Most of the research was carried out while he was at Washington University.

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Here Dr. Compton is shown with the experimental apparatus with which he demonstrated the particle nature of X-rays, the "Compton effect," for which he won the Nobel Prize.

In 1932, Dr. Compton was pictured at the University of Chicago as he prepared for an expedition to mountains in Panama, Peru, New Zealand, Australia, Hawaii, and Alaska to measure cosmic rays.



At the 1951 Commencement, Chancellor Compton strolls to the Field House with General George C. Marshall, who delivered the Commencement address that year.



At the inauguration of Dr. Compton as chancellor, the top scientists engaged in the atomic bomb program gathered for the first time since its completion. From left: (Seated) Maj. Gen. Leslie R. Groves, Vannevar Bush, Enrico Fermi, Brig. Gen. Kenneth Nichols, George B. Peagram, Lyman J. Baiggs. Standing: Charles Allen Thomas, James B. Conant, Compton, Eugene V. Murphree, and Crawford Greenewalt.

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OTOGRAPHIE BENJAMIN COUPRIE

28, Avenue Louise, Brussels

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ABSENTS: SIR W. H. BRAGG, MM. H. DESLANDRES ET E. VAN AUBEL

In this historic photograph, taken at the 1924 Solvay Conference in Brussels, Arthur Holly Compton is shown at center, immediately behind Albert Einstein. Shown in this one picture are most of the truly great names in modern physics.



During his lifetime, Arthur Compton became the friend of many of the great figures of the world. Here, he chats with Prime Minister Nehru in India.



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During his nine years as chancellor, Arthur Holly Compton was a familiar figure on campus, not only in the classroom and laboratory, but also playing the banjo (above) or crowning queens (right).





The Comptons met at Wooster College and were married in 1916. Mrs. Compton played a major role in her husband's great career, accompanying him on his travels, sharing his interests, and acting as his hostess to people from all walks of life.



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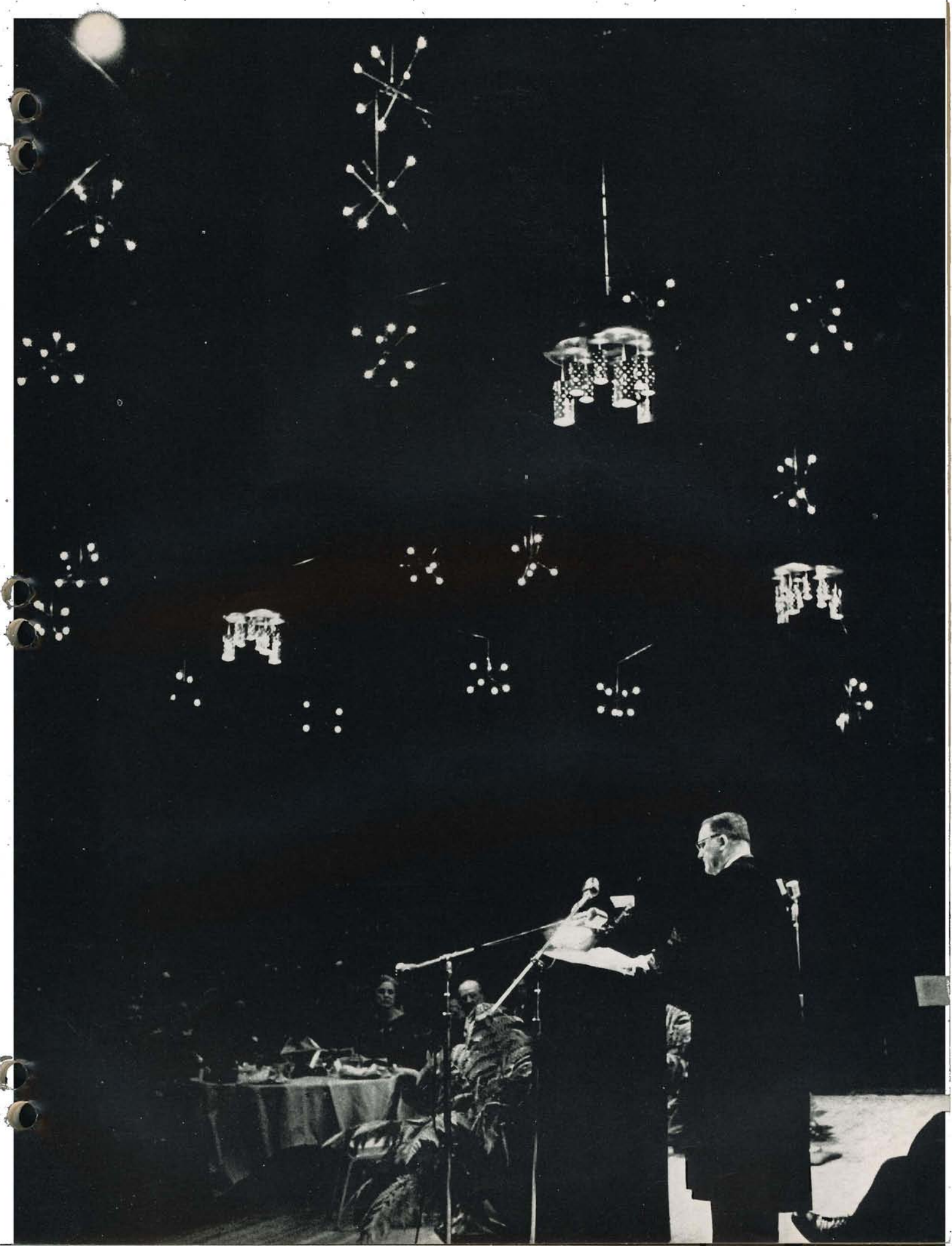


FOUNDERS DAY

A SPACE AGE CELEBRATION
OF A 109TH ANNIVERSARY

Founders Day, the annual celebration of the original founding of the University on Washington's Birthday in 1853, was bigger and better than ever this year. In fact, Founders Day this year was really Founders Week. The celebration began on a Sunday afternoon and continued through Saturday night, with concerts, seminars, special speakers, and a host of other activities leading up to the big banquet.

Many months before, James E. Webb, head of the National Aeronautics and Space Administration, had been invited to give the principal address at the Founders Day banquet. It was sheer coincidence that the first American orbital flight took place during Founders Week to add extra excitement and drama to the "Space Age" motif. The real frosting on the University's birthday cake was the last-minute decision of Cmdr. Alan B. Shepard, America's first astronaut, to accompany Mr. Webb to St. Louis and take part in the celebration.





James Webb and Cmdr. Alan B. Shepard (right) seem to be enjoying the proceedings.





Among the alumni honored at this year's Founders Banquet was Jean Browning Madeira, whose outstanding talents have made her one of the world's foremost vocal artists.



Ethan Shepley presents an award on behalf of the alumni to George E. Mylonas, professor of art and archaeology and chairman of the department, for his accomplishments as a great teacher and archaeologist.



Cmdr. Alan B. Shepard, America's first astronaut, spoke briefly on the challenge of the Space Age and on the role the universities of America are playing in the success of the nation's space program.



Three "S's" on the speakers' platform: Shepley, Shepard, and Symington. Senator Symington, who accompanied Webb and Shepard on their trip to St. Louis, was instrumental in bringing the astronaut here.



Another outstanding faculty member honored by the alumni was Fred Conway (right), internationally known painter and an instructor in the School of Fine Arts since 1933.



In his role as Grand Marshal, Dean William G. Bowling performs the hooding ceremony upon the presentation of the honorary degree of Doctor of Science to James E. Webb. Chancellor Carl Tolman looks on.



SPACE, TECHNOLOGY, AND THE MODERN UNIVERSITY

From the Founders Day Address

By JAMES E. WEBB, Administrator,

National Aeronautics and Space Administration

SPACE SCIENCE AND SPACE EXPLORATION have become an integral and vital part of the great industrial and technological revolution now taking place in our own country and throughout the world. This revolution is of such great dimensions and is developing at such a rapid pace that coping with it is making the most extraordinary demands upon our mental, emotional, physical, and financial capabilities. The pace itself, already incredibly fast, is one of the dominant facts of our time.

In one average life span, we have experienced several so-called "ages": the Air Age, the Age of Creative Chemistry, the Age of Synthetics, the Atomic Age, and now the Space Age. As these informal, catchy, and loosely placed time-labels indicate, the years of this century have been and are to be marked by unprecedented scientific advancement and technological development.

Historically, whenever we have experienced a significant innovation, we have also experienced great changes in our patterns for living—changes induced by this same innovation. A good example is the development of the airplane as an efficient carrier of men and goods at speeds undreamed of in our earth-bound days, shrinking the globe and putting all nations into close proximity for air war or air commerce. Another is the harnessing of nuclear energy, and all its implications for destruction or good.

As we reach out into space, probing its mysteries, we again are experiencing profound changes induced by space science and technology. We are priming a tremendous tide of scientific and technological creativity as we reach into space with probes and satellites, and as we send men to orbit the earth and lay plans and build the machines to land on the moon and conquer its mysteries and through it the mysteries of the universe.

The U.S. space program has from the beginning had four general objectives: (1) to study the space environment by scientific instruments of many types launched into space by sounding rockets, space probes, earth satellites, and artificial planets; (2) to begin the exploration of space and the solar system by man himself; (3) to apply space science and technology to the development of earth satellites for peaceful purposes to promote human welfare; and (4) to apply space science and technology in support of military purposes for national defense and security.

WHY, YOU MAY ASK, should the United States spend the billions necessary for the exploration of space? Let's start with the *quest for scientific knowledge*. The continuous search for scientific knowledge is a major objective of the NASA program. Our manned and unmanned lunar exploration is a giant step, but only a step, toward

*“We must survive and continue to prosper . . .
by achieving excellence in the physical sciences,
yes, but also in the humanities, the arts,
and the social and behavioral sciences.”*

the exploration of our solar system, and later, of our universe. The NASA program of space science is carried out in many universities, including Washington University, as well as in our NASA laboratories and in industry. Its strong thrust is in basic research. The scientists who are participating in the program are motivated by disciplined curiosity, which leads them to explore, to probe, to investigate, and to measure as many as possible of the phenomena of the universe. To them the tremendous breadth and scope of space science is stimulating and exciting, and it affords an unusual opportunity to attempt solutions to the most important and fundamental problems of the frontiers of science today.

THIS THIRST FOR KNOWLEDGE through space science is inseparable from all the rest of scientific study carried out on the earth. It is interesting and important to note that many scientific disciplines that have in the past gone their separate ways with only mild interactions now tackle in close partnership the problem of understanding the phenomena of outer space.

In the few short years since orbiting our first satellite, we have already gained much new information about our earth and our solar system. Much of this earlier information was gained through use of satellites which were relatively small because of launch vehicle limitations. We are

now developing launch vehicles with greatly improved load-carrying capabilities. These will enable us to orbit larger and more useful advanced scientific satellites.

The objective of acquiring new knowledge extends, of course, to the area of space biology. Our biosciences program is designed to search for extraterrestrial life and to study the effects that strange environments, particularly those of space and the planets, have on living organisms. These activities involve the search for answers to several questions which have been in the minds of men throughout the ages. Is there life on other planets of the solar system or elsewhere in the galaxies? Is there organic matter on the moon? Are there living micro-organisms beneath the surface of the moon? How did organic matter—nucleic acids, genes, protoplasm, cells, and life itself—originate? What effect does space radiation have on biological materials?

Project Mercury is well known to you. We in NASA are proud of the results achieved in this manned space flight program. It was our objective to launch a manned satellite into a controlled three-orbit flight about 100 miles above the earth, to bring it back safely to earth, and to proceed, step by step, to find out what it takes for man to do useful work in space. The powerful rockets, which we have now designed and approved for inclusion in our national joint civilian-military launch vehicle program, and have con-



tracted with American industry to build, will shortly give us a capacity for manned space flight second to none. We expect to use this capacity for the good of all mankind, but we are not unmindful of the fact that the rocket-flight vehicles and the technological know-how developed will insure against a surprise military capability developed in secret by another nation.

We are actively moving on a follow-up to Project Mercury which involves a larger spacecraft capable of more extensive space flight operation. This is Project Gemini, which has three major objectives: (1) operational space flight experience with *two* men; (2) orbital flights of up to one week's duration; and (3) the attainment of rendezvous technology and operational experience.

You will recall that in his May 25, 1961, State of the Union Message, President Kennedy said: "Now is the time to act, to take longer strides . . . time for a great new American enterprise . . . time for this nation to take a clearly leading role in space achievement."

This call to action has been heeded. The national space program is accelerating, and before the end of 1970 we plan to land a scientist-astronaut team on the moon and return them safely to earth with invaluable additions to our knowledge of the universe. Our program for taking exploration teams to the moon is Project Apollo.

We believe that, although instruments aboard un-

manned probes and satellites can perform many tasks of sensing and transmitting statistical information gathered in space, men are necessary in space expeditions for understanding and projecting lines of inquiry to reveal the larger realities. The most advanced apparatus can perform only as it is designed. Instruments have little flexibility to meet unforeseen situations. For best results in space exploration, scientific measurements acquired by instruments must be balanced by on-the-spot human senses, human reasoning, and by the power of judgment compounded by these human elements. That is why man, as well as instruments, must venture into space.

LET ME TURN NOW to the *practical applications and values* that arise from active programs of space science and technology.

It is general knowledge that any major advance toward a broad technological goal pays dividends in virtually all scientific and engineering fields. Already our national investment in space exploration has provided new metals, alloys, fabrics, compounds, and other materials which have gone into commercial production. These space-related developments constitute the practical values of our space program. The stimulus, the knowledge, and the products evolving from the space program are creating a technology that is certain to radiate great and diversified benefits to

almost every area of material and intellectual activity.

Two outstanding practical uses of earth satellite experiments promise to lead to vastly improved weather forecasting services and to greatly expanded global communications.

For men to keep alive in space they must have food and water, yet large and heavy quantities are not feasible because of their weight. Hence, in space research there have been advances in food preparations, their storage, and preservation. Research on the food a human needs for space flight will most probably lead to improved nutrition for those on earth. The development of new foods could prove invaluable as the world's population expands and the demand for food multiplies.

The search for ways to re-use water aboard manned spacecraft is pointing the way toward solving our water shortage problems. Space research on water recycling may speed the answer, for instance, to the economical desalting of sea water.

Telemetry, the combination of the more-common radio with radar, is used to track satellites and space probes, to transmit and receive information, and to control space devices by remote control. Vital to the space program, telemetry also is hard at work on non-space problems. One clinic in Detroit has installed a telemetering system to monitor about 30 patients, reducing materially the normal ratio of nurses needed for such activity. The University of North Carolina School of Medicine is using telemetry in open-heart surgery to indicate the moment-by-moment condition of the patient during the operation and to monitor the patient's progress after the operation.

Compact power sources that will operate reliably over long periods of time are important for all our spacecraft. Development of these has led to sunpowered batteries, solar cells, fuel cells, lightweight atomic reactors, and other relatively small sources of power for instruments and telemetry equipment.

The number and nature of practical results are largely unforeseeable. Furthermore, the concentration of effort required in our space program does not diminish efforts expended on other frontiers of knowledge, but rather spurs such activities. There are indications that the space program may help fight against cancer by advances in medical instrumentation and by research in bioastronautics. Fields of activity such as oceanography, geophysics, and the physics of high-energy particles have all been given great stimulation.

NOW I WOULD LIKE TO TOUCH briefly on *economic values and implications*. The technology we are developing to explore space will be of immense and growing benefit to the economy. As this new space industry expands, it will create new jobs, taking up some of the slack caused by automation. There are more than 5,000 industrial and research organizations engaged in civilian and military space-related programs. More than 3,200 different space-related products have been developed thus far. It is important to note that the dollars involved in the effort to place a team of scientists and explorers on the moon will

be spent, not on the moon, but right here on earth—in our laboratories, shops, and factories. Ninety-two per cent of NASA's 1963 budget will be used to pay for work by universities and industry.

Now, with respect to space and our *national stature and prestige*. We are in competition with just about every aspect of the Communist way of life, and, unless we compete strongly, ably, and successfully with the Soviet Union in space activities and the underlying technologies, our national prestige will suffer in the eyes of other nations. The people in these countries are equating space successes and the leadership of the future. Space achievements are a symbol of tomorrow's scientific and technical supremacy. Hence, it is important, as a device of foreign policy and diplomacy, to establish a definite position of leadership in order to increase the regard in which we are held internationally.

Typical of the dramatic world "firsts" still to be accomplished are space-craft rendezvous; manned flight to the moon; unmanned spacecraft orbit of Mars and return to earth; world-wide communications via space, including trans-oceanic television; and establishment of effective world-wide weather forecasting based on satellite systems.

Now, in touching on *national security*, let me make clear that I do not feel it is my proper role to speak about military space missions. However, I can state as an important fact that there is a willing and ready interchange of components and vehicles between our military and non-military programs. I believe that if we allow the Russians to surpass us, their space technology in its military aspects will be used to jeopardize our national security. As Vice President Johnson said in an address to the American Rocket Society last October 14, "We are developing peaceful uses of outer space from choice, but we are working on military uses of outer space from necessity."

AND NOW, SPECIFICALLY in relation to Washington University and the important activities of Founders Day, when men and women return to the University to renew their faith and dedication to the institution that helped perhaps as much as anything else to shape their lives and to help them "think big and think ahead" with the great minds on the campus, I should like to point out the tremendous scope of the NASA activities. They cut across all disciplinary lines and represent a massive team effort involving industry, labor, education, and government.

On NASA rests a very real responsibility for providing the educational information resources necessary for adequate development of public understanding of the role of the United States in space exploration for peaceful purposes. We also feel that we have an obligation to create a national awareness of the need to seek out and assist students who have an aptitude for and interest in preparing for careers in space sciences. We depend upon the nation's educational institutions to provide trained personnel to carry on space and space-related programs. But we also look to academic institutions for strong contributions to our scientific and technological progress. Currently NASA has contracts and grants in excess of \$20 million with more

than 60 different universities for advanced research and development activities. By action such as this we hope to support and help schools and colleges in their efforts to build the strong basic educational programs that are essential to our national progress.

Controversies over educational philosophies have existed throughout the ages of our nation and the world. In the 1930's there was a shift from an emphasis upon the three "R's" in the direction of the so-called "social or life adjustment" philosophy. This trend continued until the post-World War II period, but the further it went the more resistance it met. Nevertheless, it took the impact of the supposedly backward Russians splitting the atom and putting its energy into weapons of war and placing a Sputnik in orbit to point up the need for some dramatic actions as well as thoughts about our educational philosophy and practices.

I point to this only to emphasize that, just as in all areas, new conditions demand new approaches, and in education what we really need is a mature effort to improve our entire undermanned, inadequately equipped, and over-burdened school systems all the way from kindergarten through college. Much has been done in the past few years, but much remains to be done. As we have taken steps toward reaching the national goal of a stronger educational program, improved science education has changed from a hope to an imperative.

Further, the artificial separation between liberal arts and a scientific education should be removed. Our culture is the sum total of our knowledge and experience in the arts and in the sciences. Knowledge of the universe in which we live is certainly an important part of that culture.

The pace of our space program cannot continue, much less accelerate, without the enthusiastic support of the country's educational institutions and professional organizations at all levels—elementary, secondary, undergraduate, and graduate. We in the National Aeronautics and Space Administration have especially strong feelings for the importance of developing talent among the young people who exhibit interest and aptitudes in the sciences.

We do not want, however, our schools, colleges, and universities to produce for us specially educated and trained "space scientists" or "space engineers." We would be distressed to see exploration of so-called space science at the expense of weakening our national efforts in other scientific and cultural endeavors. The national space program embracing space exploration and the associated technology is, and should continue to be, part of a well-balanced national effort in all science and technology, the social sciences, and the humanities.

MOST STUDENTS ENTERING COLLEGE are not headed toward careers in science or engineering. The majority of them will not need the highly specialized knowledge required by those who plan to become professional scientists. But again, all should have an understanding of science and mathematics, primarily because of the nature of our times.

The National Aeronautics and Space Administration has

been developing an educational services program designed to assist schools, colleges, and the public to meet the needs of education in and for the Space Age. I should like to emphasize the word "service," for we see our role in this field as one of assistance, cooperation, and collaboration, when and where requested.

We are assisting colleges and universities in organizing and conducting workshops and other programs designed to provide teachers at all age and grade levels with better understanding of space science and technology and of the implications of our push into space—socially, economically, and politically.

In conclusion:

Space exploration has become a powerful force exerting great influence upon our present and future—socially, economically, politically, and morally.

WHATEVER THE SCHOOLS MAY OR MAY NOT DO, OUR children are, and will increasingly be, exposed to results of accelerated scientific advances and technical developments through newspapers, radio, television, and word of mouth. They can, however, acquire adequate understanding of these societal forces *only through an orderly intellectual experience*. This orderly experience is the responsibility of the school, and the school is in large measure the responsibility of the university.

The National Science Foundation last month released a study of Soviet education prepared by Nicholas DeWitt, an associate at Harvard University's Russian Research Center. The *Washington Post* headline on the story covering the study was: "Soviets Veer Teaching to Science Primacy." The study pointed out that in the Soviet Union a high premium is placed upon technical and specialized, rather than general, excellence. Science and technology are particularly recognized as the foundation of national strength.

Dr. DeWitt states: "If the aim of education is to develop a creative intellect critical of society and its values, *then Soviet higher education is an obvious failure*. If its aim is to develop applied professional skills enabling the individual to perform specialized, functional tasks, then Soviet higher education is unquestionably a success, posing not only a temporary challenge, but a major threat in the long-range struggle between democracy and totalitarianism."

This statement is worth pondering. If we assume it as unquestionable fact, the job ahead of us in education is indeed of immense proportions. Certainly we must not and, I trust, will not diminish or dilute our national aim in education to develop a creative intellect and a citizen well-rounded, well-grounded, and educated to live and appreciate an effective life for himself and for all others. Yet, if to allow ourselves to be surpassed by totalitarianism in the fields of applied science and technology means the eventual loss of democracy in the struggle for survival, we just cannot let it happen. Obviously, then, we must survive and continue to prosper by sheer persistence, by exerting old-time American initiative, by achieving excellence in the physical sciences, yes, but also in the humanities, the arts, and the social and behavioral sciences.



CONVERSATION AT WOHL

DESPITE TELEVISION, picture magazines, and cocktail parties, people still like to talk. If given the chance, they even like to talk about serious subjects. This little-known phenomenon was demonstrated so successfully at the alumni seminars during Commencement week last year that a similar series was offered as part of Founders Week this year.

Nearly one hundred alumni showed up at Wohl Center on the morning of Founders Day for three hours of solid conversation on a solid subject. The formula is simple. A subject is chosen; somebody who has thought about the subject states his opinion before the whole group; then the participants break up into smaller groups, each with a faculty leader, to discuss, defend, disagree, or digress.

At the Founders Day seminars, the topic "Human Values in the Age of Technology" was tossed up for grabs. The opening statement was made by Joseph R. Passonneau, dean of the School of Architecture. Leading the seminars were: Barry Commoner, professor of plant physiology; Gerald L. Esterson, associate professor of chemical engineering; Eugene Feenberg, professor of physics; William E. Gordon, professor of research in social work; Carl A. Moyer, Bixby professor of surgery; and Richard Wade, professor of history.

Participating in the seminars was a broad cross-section of alumni: old grads and recent graduates, schoolteachers and housewives, professional men and businessmen, liberal arts graduates and engineers.

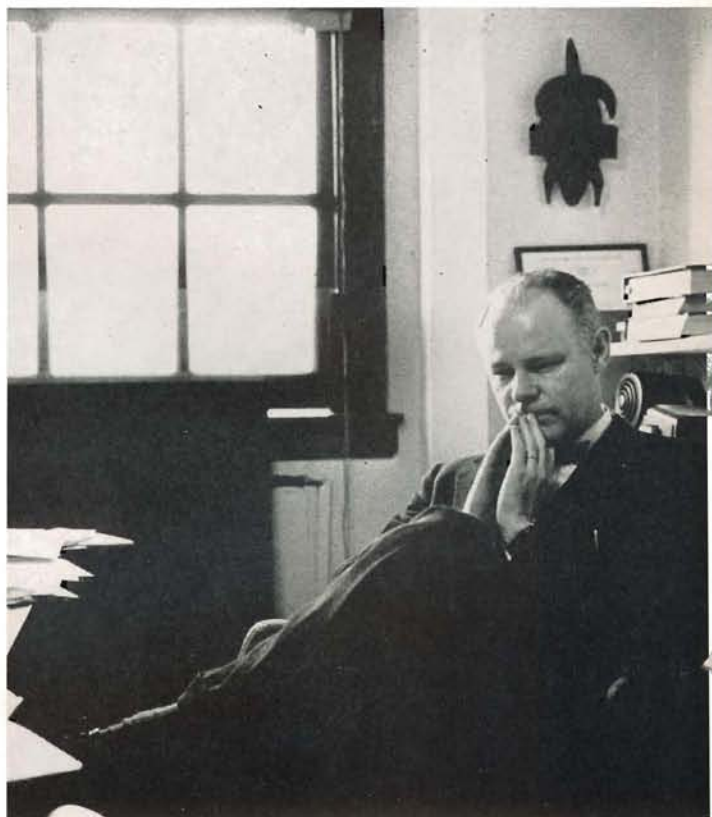
In his opening statement, Dean Passonneau said in part: "Technology is re-writing, in fact, if not in the libraries, social and cultural history. Our technological age seems to be an age of anxiety and purposelessness. The evidence of our daily experience is affirmed by the savage social criticism implicit in all of the contemporary arts. The great universities must recognize the profound effect of technology in shaping the modern mind. Technology, in turn, must bring its special techniques to bear on questions of value."

In the discussion that followed, Dean Passonneau's statement served primarily as a point of departure for discussions that ranged far and wide. The faculty leaders were there not to lecture but to lead—to help direct the flow of conversation and to blow the whistle when the groups strayed too far afield.

Quite obviously, none of the groups came up with any pat answers. The intricate, profound problem of the place of human values in the age of technology was not solved at Wohl Center on a Saturday morning in February.

However, the seminars did give a group of alumni a rare opportunity to sit down and talk at length about something of importance. It gave them the chance to air their own thoughts and to hear the opinions of others. It gave them some new slants on old ideas, some fresh approaches to major problems.

Most of all, it gave them something to think about.



Joseph R. Passonneau, dean of the School of Architecture, set the stage for the seminars with his introductory statement.

"Man is no longer dependent on his physical environment for his evolution; the realm of ideas is now the most important environment for man. Man's physical evolution is slowing down; the important changes will occur in his intellectual, social, and spiritual development."—From the seminar led by William E. Gordon



"Man is now able to manipulate systems whose complete results he dare not check against nature, since the very checking might mean mankind's ultimate destruction. Possible conclusion: We must teach students that the human purposes of science are the welfare of human beings."—From the seminar led by Barry Commoner





"The value judgments that must be made in the rapidly changing world of technology cannot be taught in a vacuum. The university can attempt to develop and nourish these attitudes, but the role of the home and of society in general is critical."—From the seminar led by Eugene Feenberg



CONVERSATION AT WOHL



"The primary responsibility of the American university is still the education of men and women to be citizens, to be constructive and appreciative human beings rather than passive homunculi, and to provide them with the capabilities to make sound moral, social, and political decisions."—From the seminar led by Dr. Moyer

"In spite of the problems that may be produced by improving technology, the scientists and technologists must continue to work. Throughout history, man has shown a remarkable ability to rise above any destructive situation he has created."—From the seminar led by Gerald L. Esterson



"Freedom and concern for human welfare are intrinsic to Western society. Beyond these factors, there is much disagreement on established values, but this diversity is beneficial and makes for a healthy society."—From the seminar led by Richard Wade



Who will go to college—and where?
What will they find?
Who will teach them?
Will they graduate?
What will college have done for them?
Who will pay—and how?

the COLLEGE of TOMORROW

“WILL MY CHILDREN GET INTO COLLEGE?”
The question haunts most parents. Here is the answer:

Yes...

- ▶ If they graduate from high school or preparatory school with something better than a “scrape-by” record.
- ▶ If they apply to the college or university that is right for them—aiming their sights (and their application forms) neither too high nor too low, but with an individuality and precision made possible by sound guidance both in school and in their home.
- ▶ If America’s colleges and universities can find the resources to carry out their plans to meet the huge demand for higher education that is certain to exist in this country for years to come.

The *if*’s surrounding your children and the college of tomorrow are matters of concern to everyone involved—to parents, to children, to alumni and alumnae (whatever their parental status), and to the nation’s educators. But resolving them is by no means being left to chance.

- ▶ The colleges know what they must do, if they are to

meet the needs of your children and others of your children’s generation. Their planning is well beyond the hand-wringing stage.

- ▶ The colleges know the likely cost of putting their plans into effect. They know this cost, both in money and in manpower, will be staggering. But most of them are already embarked upon finding the means of meeting it.
- ▶ Governments—local, state, and federal—are also deeply involved in educational planning and financing. Some parts of the country are far ahead of others. But no region is without its planners and its doers in this field.
- ▶ Public demand—not only for *expanded facilities* for higher education, but for *ever-better quality* in higher education—today is more insistent, more informed than ever before. With this growth of public sophistication about higher education, it is now clear to most intelligent parents that they themselves must take a leading role in guiding their children’s educational careers—and in making certain that the college of tomorrow will be ready, and good, for them.

This special report is in the form of a guide to parents. But we suspect that every reader, parent or not, will find the story of higher education’s future remarkably exciting.

Where will your children go to college?

LAST FALL, more than one million students enrolled in the freshman classes of U.S. colleges and universities. They came from wealthy families, middle-income families, poor families; from all races, here and abroad; from virtually every religious faith.

Over the next ten years, the number of students will grow enormously. Around 1964 the long-predicted "tidal wave" of young people, born in the postwar era and steadily moving upward through the nation's school systems ever since, will engulf the college campuses. By 1970 the population between the ages of 18 and 21—now around 10.2 million—will have grown to 14.6 million. College enrollment, now less than 4 million, will be at least 6.4 million, and perhaps far more.

The character of the student bodies will also have changed. More than half of the full-time students in the country's four-year colleges are already coming from lower-middle and low income groups. With expanding scholarship, loan, and self-help programs, this trend will continue strong. Non-white college students—who in the past decade have more than doubled in number and now compose about 7 per cent of the total enrollment—will continue to increase. (Non-whites formed 11.4 per cent of the U.S. population in the 1960 census.) The number of married students will grow. The average age of students will continue its recent rise.

The sheer force of this great wave of students is enough to take one's breath away. Against this force, what chance has American higher education to stand strong, to maintain standards, to improve quality, to keep sight of the individual student?

And, as part of the gigantic population swell, what chances have your children?

TO BOTH QUESTIONS, there are some encouraging answers. At the same time, the intelligent parent will not ignore some danger signals.

FINDING ROOM FOR EVERYBODY

NOT EVERY COLLEGE or university in the country is able to expand its student capacity. A number have concluded that, for one persuasive reason or another, they must maintain their present enrollments. They are not blind to the need of American higher education, in the aggregate, to accommodate more students in the years ahead; indeed,

they are keenly aware of it. But for reasons of finance, of faculty limitations, of space, of philosophy, of function, of geographic location—or of a combination of these and other restrictions—they cannot grow.

Many other institutions, public and private, *are* expanding their enrollment capacities and will continue to do so:

Private institutions: Currently, colleges and universities under independent auspices enroll around 1,500,000 students—some 40 per cent of the U.S. college population. In the future, many privately supported institutions will grow, but slowly in comparison with publicly supported institutions. Thus the total number of students at private institutions will rise, but their percentage of the total college population will become smaller.

Public institutions: State and locally supported colleges and universities are expanding their capacity steadily. In the years ahead they will carry by far the heaviest share of America's growing student population.

Despite their growth, many of them are already feeling the strain of the burden. Many state institutions, once committed to accepting any resident with a high-school diploma, are now imposing entrance requirements upon applicants. Others, required by law or long tradition not to turn away any high-school graduate who applies, resort in desperation to a high flunk-out rate in the freshman year in order to whittle down their student bodies to manageable size. In other states, coordinated systems of higher education are being devised to accommodate



students of differing aptitudes, high-school academic records, and career goals.

Two-year colleges: Growing at a faster rate than any other segment of U.S. higher education is a group comprising both public and independently supported institutions: the two-year, or "junior," colleges. Approximately 600 now exist in the United States, and experts estimate that an average of at least 20 per year will be established in the coming decade. More than 400 of the two-year institutions are community colleges, located within commuting distance of their students.

These colleges provide three main services: education for students who will later transfer to four-year colleges or universities (studies show they often do as well as those who go directly from high school to a four-year institution, and sometimes better), terminal training for vocations (more and more important as jobs require higher technical skills), and adult education and community cultural activities.

Evidence of their importance: One out of every four students beginning higher education today does so in a two-year college. By 1975, the ratio is likely to be one in two.

Branch campuses: To meet local demands for educational institutions, some state universities have opened branches in population centers distant from their main campuses. The trend is likely to continue. On occasion, however, the "branch campus" concept may conflict with the "community college" concept. In Ohio, for example, proponents of community two-year colleges are currently arguing that locally controlled community institutions are the best answer to the state's college-enrollment problems. But Ohio State University, Ohio University, and Miami University, which operate off-campus centers and whose leaders advocate the establishment of more, say that taxpayers get better value at lower cost from a university-run branch-campus system.

Coordinated systems: To meet both present and future demands for higher education, a number of states are attempting to coordinate their existing colleges and universities and to lay long-range plans for developing new ones.

California, a leader in such efforts, has a "master plan" involving not only the three main types of publicly supported institutions—the state university, state colleges, and locally sponsored two-year colleges. Private institutions voluntarily take part in the master planning, also.

With at least 661,000 students expected in their colleges and universities by 1975, Californians have worked out a plan under which every high-school graduate will be eligible to attend a junior college; the top one-third will be eligible for admission to a state college; and the top one-eighth will be eligible to go directly from high school to the University of California. The plan is flexible: students who prove themselves in a junior college, for



ILLUSTRATIONS BY PEGGY SOUCHECK

example, may transfer to the university. If past experience is a guide, many will—with notable academic success.

THUS IT IS LIKELY that somewhere in America's nearly 2,000 colleges and universities there will be room for your children.

How will you—and they—find it?

On the same day in late May of last year, 33,559 letters went out to young people who had applied for admission to the 1961 freshman class in one or more of the eight schools that compose the Ivy League. Of these letters, 20,248 were rejection notices.

Not all of the 20,248 had been misguided in applying. Admissions officers testify that the quality of the 1961 applicants was higher than ever before, that the competition was therefore intense, and that many applicants who might have been welcomed in other years had to be turned away in '61.

Even so, as in years past, a number of the applicants had been the victims of bad advice—from parents, teachers, and friends. Had they applied to other institutions, equally or better suited to their aptitudes and abilities, they would have been accepted gladly, avoiding the bitter disappointment, and the occasional tragedy, of a turnaround.

The Ivy League experience can be, and is, repeated in dozens of other colleges and universities every spring. Yet, while some institutions are rejecting more applications than they can accept, others (perhaps better qualified to meet the rejected students' needs) still have openings in their freshman classes on registration day.

Educators, both in the colleges and in the secondary schools, are aware of the problems in "marrying" the right students to the right colleges. An intensive effort is under way to relieve them. In the future, you may expect:

► Better guidance by high-school counselors, based on

improved testing methods and on improved understanding of individual colleges and their offerings.

► Better definitions, by individual colleges and universities, of their philosophies of admission, their criteria for choosing students, their strengths in meeting the needs of certain types of student and their weakness in meeting the needs of others.

► Less parental pressure on their offspring to attend: the college or university that mother or father attended; the college or university that "everybody else's children" are attending; the college or university that enjoys the greatest sports-page prestige, the greatest financial-page prestige, or the greatest society-page prestige in town.

► More awareness that children are different from one another, that colleges are different from one another, and

that a happy match of children and institutions is within the reach of any parent (and student) who takes the pains to pursue it intelligently.

► Exploration—but probably, in the near future, no widespread adoption—of a central clearing-house for college applications, with students stating their choices of colleges in preferential order and colleges similarly listing their choices of students. The "clearing-house" would thereupon match students and institutions according to their preferences.

Despite the likely growth of these practices, applying to college may well continue to be part-chaos, part-panic, part-snobishness for years to come. But with the aid of enlightened parents and educators, it will be less so, tomorrow, than it is today.

What will they find in college?

THE COLLEGE OF TOMORROW—the one your children will find when they get in—is likely to differ from the college you knew in *your* days as a student.

The students themselves will be different.

Curricula will be different.

Extracurricular activities will be different, in many respects, from what they were in your day.

The college year, as well as the college day, may be different.

Modes of study will be different.

With one or two conspicuous exceptions, the changes will be for the better. But for better or for worse, changes there will be.

THE NEW BREED OF STUDENTS

IT WILL COME AS NEWS to no parents that their children are different from themselves.

Academically, they are proving to be more serious than many of their predecessor generations. Too serious, some say. They enter college with an eye already set on the vocation they hope to pursue when they get out; college, to many, is simply the means to that end.

Many students plan to marry as soon as they can afford to, and some even before they can afford to. They want families, homes, a fair amount of leisure, good jobs, security. They dream not of a far-distant future; today's students are impatient to translate their dreams into reality, *soon*.

Like most generalizations, these should be qualified. There will be students who are quite far from the average, and this is as it should be. But with international tensions, recurrent war threats, military-service obligations, and talk of utter destruction of the race, the tendency is for the young to want to cram their lives full of living—with no unnecessary delays, please.

At the moment, there is little likelihood that the urge to pace one's life quickly and seriously will soon pass. This is the tempo the adult world has set for its young, and they will march doubletime to it.

Economic backgrounds of students will continue to grow more diverse. In recent years, thanks to scholarships, student loans, and the spectacular growth of public educational institutions, higher education has become less and less the exclusive province of the sons and daughters of the well-to-do. The spread of scholarship and loan programs geared to family income levels will intensify this trend, not only in low-tuition public colleges and universities but in high-tuition private institutions.

Students from foreign countries will flock to the U.S. for college education, barring a totally deteriorated international situation. Last year 53,107 foreign students, from 143 countries and political areas, were enrolled in 1,666 American colleges and universities—almost a 10 per cent increase over the year before. Growing numbers of African and Asian students accounted for the rise; the growth is virtually certain to continue. The presence of

such students on U.S. campuses—50 per cent of them are undergraduates—has already contributed to a greater international awareness on the part of American students. The influence is bound to grow.

Foreign study by U.S. students is increasing. In 1959-60, the most recent year reported, 15,306 were enrolled in 63 foreign countries, a 12 per cent increase in a period of 12 months. Students traveling abroad during summer vacations add impressive numbers to this total.

WHAT THEY'LL STUDY

STUDIES ARE in the course of change, and the changes will affect your children. A new toughness in academic standards will reflect the great amount of knowledge that must be imparted in the college years.

In the sciences, changes are particularly obvious. Every decade, writes Thomas Stelson of Carnegie Tech, 25 per cent of the curriculum must be abandoned, due to obsolescence. J. Robert Oppenheimer puts it another way: nearly everything now known in science, he says, "was not in any book when most of us went to school."

There will be differences **in the social sciences and humanities**, as well. Language instruction, now getting new emphasis, is an example. The use of language laboratories, with tape recordings and other mechanical devices, is already popular and will spread. Schools once preoccupied almost entirely with science and technology (e.g., colleges of engineering, leading medical schools) have now integrated social and humanistic studies into their curricula, and the trend will spread to other institutions.

International emphasis also will grow. The big push will be related to nations and regions outside the Western World. For the first time on a large scale, the involvement

of U.S. higher education will be truly global. This non-Western orientation, says one college president (who is seconded by many others) is "the new frontier in American higher education." For undergraduates, comparative studies in both the social sciences and the humanities are likely to be stressed. The hoped-for result: better understanding of the human experience in all cultures.

Mechanics of teaching will improve. "Teaching machines" will be used more and more, as educators assess their value and versatility (see *Who will teach them?* on the following pages). Closed-circuit television will carry a lecturer's voice and closeup views of his demonstrations to hundreds of students simultaneously. TV and microfilm will grow in usefulness as library tools, enabling institutions to duplicate, in small space, the resources of distant libraries and specialized rare-book collections. Tape recordings will put music and drama, performed by masters, on every campus. Computers, already becoming almost commonplace, will be used for more and more study and research purposes.

This availability of resources unheard-of in their parents' day will enable undergraduates to embark on extensive programs of independent study. Under careful faculty guidance, independent study will equip students with research ability, problem-solving techniques, and bibliographic savvy which should be of immense value to them throughout their lives. Many of yesterday's college graduates still don't know how to work creatively in unfamiliar intellectual territory: to pinpoint a problem, formulate intelligent questions, use a library, map a research project. There will be far fewer gaps of this sort in the training of tomorrow's students.

Great new stress on quality will be found at all institutions. Impending explosive growth of the college population has put the spotlight, for years, on handling large numbers of students; this has worried educators who feared that *quality* might be lost in a national preoccupation with *quantity*. Big institutions, particularly those with "growth situations," are now putting emphasis on maintaining high academic standards—and even raising them—while handling high enrollments, too. Honors programs, opportunities for undergraduate research, insistence on creditable scholastic achievement are symptomatic of the concern for academic excellence.

It's important to realize that this emphasis on quality will be found not only in four-year colleges and universities, but in two-year institutions, also. "Each [type of institution] shall strive for excellence in its sphere," is how the California master plan for higher education puts it; the same idea is pervading higher education at all levels throughout the nation.

WHERE'S THE FUN?

EXTRACURRICULAR ACTIVITY has been undergoing subtle changes at colleges and universities for years and is likely



to continue doing so. Student apathy toward some activities—political clubs, for example—is lessening. Toward other activities—the light, the frothy—apathy appears to be growing. There is less interest in spectator sports, more interest in participant sports that will be playable for most of a lifetime. Student newspapers, observes the dean of students at a college on the Eastern seaboard, no longer rant about band uniforms, closing hours for fraternity parties, and the need for bigger pep rallies. Sororities are disappearing from the campuses of women's colleges. "Fun festivals" are granted less time and importance by students; at one big midwestern university, for example, the events of May Week—formerly a five-day wingding involving floats, honorary-fraternity initiations, faculty-student baseball, and crowning of the May Queen—are now crammed into one half-day. In spite of the well-publicized antics of a relatively few roof-raisers (e.g., student rioters at several summer resorts last Labor Day, student revelers at Florida resorts during spring-vacation periods), a new seriousness is the keynote of most student activities.

"The faculty and administration are more resistant to these changes than the students are," jokes the president of a women's college in Pittsburgh. "The typical student congress wants to abolish the junior prom; the dean is the

one who feels nostalgic about it: 'That's the one event Mrs. Jones and I looked forward to each year.' "

A QUEST FOR ETHICAL VALUES

EDUCATION, more and more educators are saying, "should be much more than the mere retention of subject matter."

Here are three indications of how the thoughts of many educators are running:

"If [the student] enters college and pursues either an intellectual smörgåsbord, intellectual Teutonism, or the cash register," says a midwestern educator, "his education will have advanced very little, if at all. The odds are quite good that he will simply have exchanged one form of barbarism for another . . . Certainly there is no incompatibility between being well-informed and being stupid; such a condition makes the student a danger to himself and society."

Says another observer: "I prophesy that a more serious intention and mood will progressively characterize the campus . . . This means, most of all, commitment to the use of one's learning in fruitful, creative, and noble ways."

"The responsibility of the educated man," says the provost of a state university in New England, "is that he make articulate to himself and to others what he is willing to bet his life on."

Who will teach them?

KNOW THE QUALITY of the teaching that your children can look forward to, and you will know much about the effectiveness of the education they will receive. Teaching, tomorrow as in the past, is the heart of higher education.

It is no secret, by now, that college teaching has been on a plateau of crisis in the U.S. for some years. Much of the problem is traceable to money. Salaries paid to college teachers lagged far behind those paid elsewhere in jobs requiring similarly high talents. While real incomes, as well as dollar incomes, climbed for most other groups of Americans, the real incomes of college professors not merely stood still but dropped noticeably.

The financial pinch became so bad, for some teachers, that despite obvious devotion to their careers and obvious preference for this profession above all others, they had to leave for other jobs. Many bright young people, the sort who ordinarily would be attracted to teaching careers, took one look at the salary scales and decided to make their mark in another field.

Has the situation improved?

Will it be better when your children go to college?

Yes. At the moment, faculty salaries and fringe benefits (on the average) are rising. Since the rise started from an extremely disadvantageous level, however, no one is getting rich in the process. Indeed, on almost every campus the *real* income in every rank of the faculty is still considerably less than it once was. Nor have faculty salary scales, generally, caught up with the national scales in competitive areas such as business and government.

But the trend is encouraging. If it continues, the financial plight of teachers—and the serious threat to education which it has posed—should be substantially diminished by 1970.

None of this will happen automatically, of course. For evidence, check the appropriations for higher education made at your state legislature's most recent session. If yours was like a number of recent legislatures, it "economized"—and professorial salaries suffered. The support which has enabled many colleges to correct the most glaring salary deficiencies *must continue* until the problem is fully solved. After that, it is essential to make sure that



the quality of our college teaching—a truly crucial element in fashioning the minds and attitudes of your children—is not jeopardized again by a failure to pay its practitioners adequately.

THERE ARE OTHER ANGLES to the question of attracting and retaining a good faculty besides money.

► The better the student body—the more challenging, the more lively its members—the more attractive is the job of teaching it. “Nothing is more certain to make teaching a dreadful task than the feeling that you are dealing with people who have no interest in what you are talking about,” says an experienced professor at a small college in the Northwest.

“An appalling number of the students I have known were bright, tested high on their College Boards, and still lacked flair and drive and persistence,” says another professor. “I have concluded that much of the difference between them and the students who are ‘alive’ must be traceable to their homes, their fathers, their mothers. Parents who themselves take the trouble to be interesting—and interested—seem to send us children who are interesting and interested.”

► The better the library and laboratory facilities, the more likely is a college to be able to recruit and keep a good faculty. Even small colleges, devoted strictly to undergraduate studies, are finding ways to provide their faculty members with opportunities to do independent reading and research. They find it pays in many ways: the faculty teaches better, is more alert to changes in the subject matter, is less likely to leave for other fields.

► The better the public-opinion climate toward teachers in a community, the more likely is a faculty to be strong. Professors may grumble among themselves about all the invitations they receive to speak to women’s clubs and

alumni groups (“When am I supposed to find the time to check my lecture notes?”), but they take heart from the high regard for their profession which such invitations from the community represent.

► Part-time consultant jobs are an attraction to good faculty members. (Conversely, one of the principal checkpoints for many industries seeking new plant sites is, What faculty talent is nearby?) Such jobs provide teachers both with additional income and with enormously useful opportunities to base their classroom teachings on practical, current experience.

BUT COLLEGES AND UNIVERSITIES must do more than hold on to their present good teachers and replace those who retire or resign. Over the next few years many institutions must add to their teaching staffs at a prodigious rate, in order to handle the vastly larger numbers of students who are already forming lines in the admissions office.

The ability to be a college teacher is not a skill that can be acquired overnight, or in a year or two. A Ph.D. degree takes at least four years to get, after one has earned his bachelor’s degree. More often it takes six or seven years, and sometimes 10 to 15.

In every ten-year period since the turn of the century, as Bernard Berelson of Columbia University has pointed out, the production of doctorates in the U.S. has doubled. But only about 60 per cent of Ph.D.’s today go into academic life, compared with about 80 per cent at the turn of the century. And only 20 per cent wind up teaching undergraduates in liberal arts colleges.

Holders of lower degrees, therefore, will occupy many teaching positions on tomorrow’s college faculties.

This is not necessarily bad. A teacher’s ability is not always defined by the number of degrees he is entitled to

write after his name. Indeed, said the graduate dean of one great university several years ago, it is high time that "universities have the courage . . . to select men very largely on the quality of work they have done and soft-pedal this matter of degrees."

IN SUMMARY, salaries for teachers will be better, larger numbers of able young people will be attracted into the field (but their preparation will take time), and fewer able people will be lured away. In expanding their faculties, some colleges and universities will accept more holders of bachelor's and master's degrees than they have been accustomed to, but this may force them to focus attention on ability rather than to rely as unquestioningly as in the past on the magic of a doctor's degree.

Meanwhile, other developments provide grounds for cautious optimism about the effectiveness of the teaching your children will receive.

THE TV SCREEN

TELEVISION, not long ago found only in the lounges of dormitories and student unions, is now an accepted teaching tool on many campuses. Its use will grow. "To report on the use of television in teaching," says Arthur S. Adams, past president of the American Council on Education, "is like trying to catch a galloping horse."

For teaching closeup work in dentistry, surgery, and laboratory sciences, closed-circuit TV is unexcelled. The number of students who can gaze into a patient's gaping mouth while a teacher demonstrates how to fill a cavity is limited; when their place is taken by a TV camera and the students cluster around TV screens, scores can watch—and see more, too.

Television, at large schools, has the additional virtue of extending the effectiveness of a single teacher. Instead of giving the same lecture (replete with the same jokes) three times to students filling the campus's largest hall, a professor can now give it once—and be seen in as many auditoriums and classrooms as are needed to accommodate all registrants in his course. Both the professor and the jokes are fresher, as a result.

How effective is TV? Some carefully controlled studies show that students taught from the fluorescent screen do as well in some types of course (e.g., lectures) as those sitting in the teacher's presence, and sometimes better. But TV standardizes instruction to a degree that is not always desirable. And, reports Henry H. Cassirer of UNESCO, who has analyzed television teaching in the U.S., Canada, Great Britain, France, Italy, Russia, and Japan, students do not want to lose contact with their teachers. They want to be able to ask questions as instruction progresses. Mr. Cassirer found effective, on the other hand, the combination of a central TV lecturer with classroom instructors who prepare students for the lecture and then discuss it with them afterward.

TEACHING MACHINES

HOLDING GREAT PROMISE for the improvement of instruction at all levels of schooling, including college, are programs of learning presented through mechanical self-teaching devices, popularly called "teaching machines."

The most widely used machine, invented by Professor Frederick Skinner of Harvard, is a box-like device with



three windows in its top. When the student turns a crank, an item of information, along with a question about it, appears in the lefthand window (A). The student writes his answer to the question on a paper strip exposed in another window (B). The student turns the crank again—and the correct answer appears at window A.

Simultaneously, this action moves the student's answer under a transparent shield covering window C, so that the student can see, but not change, what he has written. If the answer is correct, the student turns another crank, causing the tape to be notched; the machine will by-pass this item when the student goes through the series of questions again. Questions are arranged so that each item builds on previous information the machine has given.

Such self-teaching devices have these advantages:

- Each student can proceed at his own pace, whereas classroom lectures must be paced to the "average" student—too fast for some, too slow for others. "With a machine," comments a University of Rochester psychologist, "the brighter student could go ahead at a very fast pace."
- The machine makes examinations and testing a rewarding and learning experience, rather than a punishment. If his answer is correct, the student is rewarded with that knowledge instantly; this reinforces his memory of the right information. If the answer is incorrect, the machine provides the correct answer immediately. In large classes, no teacher can provide such frequent—and individual—rewards and immediate corrections.
- The machine smooths the ups and downs in the learn-

ing process by removing some external sources of anxieties, such as fear of falling behind.

► If a student is having difficulty with a subject, the teacher can check back over his machine tapes and find the exact point at which the student began to go wrong. Correction of the difficulty can be made with precision, not gropingly as is usually necessary in machineless classes.

Not only do the machines give promise of accelerating the learning process; they introduce an individuality to

learning which has previously been unknown. "Where television holds the danger of standardized instruction," said John W. Gardner, president of the Carnegie Corporation of New York, in a report to then-President Eisenhower, "the self-teaching device can individualize instruction in ways not now possible—and the student is always an active participant." Teaching machines are being tested, and used, on a number of college campuses and seem certain to figure prominently in the teaching of your children.

Will they graduate?

S AID AN ADMINISTRATOR at a university in the South not long ago (he was the director of admissions, no less, and he spoke not entirely in jest):

"I'm happy I went to college back when I did, instead of now. Today, the admissions office probably wouldn't let me in. If they did, I doubt that I'd last more than a semester or two."

Getting into college is a problem, nowadays. Staying there, once in, can be even more difficult.

Here are some of the principal reasons why many students fail to finish:

Academic failure: For one reason or another—not always connected with a lack of aptitude or potential scholastic ability—many students fail to make the grade. Low entrance requirements, permitting students to enter college without sufficient aptitude or previous preparation, also play a big part. In schools where only a high-school diploma is required for admission, drop-outs and failures during the first two years average (nationally) between 60 and 70 per cent. Normally selective admissions procedures usually cut this rate down to between 20 and 40 per cent. Where admissions are based on keen competition, the attrition rate is 10 per cent or less.

FUTURE OUTLOOK: High schools are tightening their academic standards, insisting upon greater effort by students, and teaching the techniques of note-taking, effective studying, and library use. Such measures will inevitably better the chances of students when they reach college. Better testing and counseling programs should help, by guiding less-able students away from institutions where they'll be beyond their depth and into institutions better suited to their abilities and needs. Growing popular acceptance of the two-year college concept will also help, as will the adoption of increasingly selective admissions procedures by four-year colleges and universities.

Parents can help by encouraging activities designed to find the right academic spot for their children; by recog-

nizing their children's strengths and limitations; by creating an atmosphere in which children will be encouraged to read, to study, to develop curiosity, to accept new ideas.

Poor motivation: Students drop out of college "not only because they lack ability but because they do not have the motivation for serious study," say persons who have studied the attrition problem. This aspect of students' failure to finish college is attracting attention from educators and administrators both in colleges and in secondary schools.

FUTURE OUTLOOK: Extensive research is under way to determine whether motivation can be measured. The "Personal Values Inventory," developed by scholars at Colgate University, is one promising yardstick, providing information about a student's long-range persistence, personal self-control, and deliberateness (as opposed to rashness). Many colleges and universities are participating in the study, in an effort to establish the efficacy of the tests. Thus far, report the Colgate researchers, "the tests have successfully differentiated between over- and under-achievers in every college included in the sample."

Parents can help by their own attitudes toward scholastic achievement and by encouraging their children to



develop independence from adults. "This, coupled with the reflected image that a person acquires from his parents—an image relating to persistence and other traits and values—may have much to do with his orientation toward academic success," the Colgate investigators say.

Money: Most parents think they know the cost of sending a child to college. But, a recent survey shows, relatively few of them actually do. The average parent, the survey disclosed, underestimates college costs by roughly 40 per cent. In such a situation, parental savings for college purposes often run out quickly—and, unless the student can fill the gap with scholarship aid, a loan, or earnings from part-time employment, he drops out.

FUTURE OUTLOOK: A surprisingly high proportion of financial dropouts are children of middle-income, not low-income, families. If parents would inform themselves fully about current college costs—and reinform themselves periodically, since prices tend to go up—a substantial part of this problem could be solved in the future by realistic family savings programs.

Other probabilities: growing federal and state (as well as private) scholarship programs; growing private and governmental loan programs.

Jobs: Some students, anxious to strike out on their own, are lured from college by jobs requiring little skill but offering attractive starting salaries. Many such students may have hesitated about going to college in the first place and drop out at the first opportunity.

FUTURE OUTLOOK: The lure of jobs will always tempt some students, but awareness of the value of completing college—for lifelong financial gain, if for no other reason—is increasing.

Emotional problems: Some students find themselves unable to adjust to college life and drop out as a result. Often such problems begin when a student chooses a college that's "wrong" for him. It may accord him too much or too little freedom; its pace may be too swift for him, resulting in frustration, or too slow, resulting in boredom; it may be "too social" or "not social enough."

FUTURE OUTLOOK: With expanding and more skillful guidance counseling and psychological testing, more students can expect to be steered to the "right" college environment. This won't entirely eliminate the emotional-maladjustment problem, but it should ease it substantially.

Marriage: Many students marry while still in college but fully expect to continue their education. A number do go on (sometimes wives withdraw from college to earn money to pay their husbands' educational expenses). Others have children before graduating and must drop out of college in order to support their family.

FUTURE OUTLOOK: The trend toward early marriage shows no signs of abating. Large numbers of parents openly or tacitly encourage children to go steady and to marry at an early age. More and more colleges are provid-



ing living quarters for married undergraduate students. Some even have day-care facilities for students' young children. Attitudes and customs in their "peer groups" will continue to influence young people on the question of marrying early; in some groups, it's frowned upon; in others, it's the thing to do.

COLLEGES AND UNIVERSITIES are deeply interested in finding solutions to the attrition problem in all its aspects. Today, at many institutions, enrollment resembles a pyramid: the freshman class, at the bottom, is big; the sophomore class is smaller, the junior class still smaller, and the senior class a mere fraction of the freshman group. Such pyramids are wasteful, expensive, inefficient. They represent hundreds, sometimes thousands, of personal tragedies: young people who didn't make it.

The goal of the colleges is to change the pyramid into a straight-sided figure, with as many people graduating as enter the freshman class. In the college of tomorrow, the sides will not yet have attained the perfect vertical, but—as a result of improved placement, admissions, and academic practices—they should slope considerably less than they do now.

What will college have done for them?

IF YOUR CHILDREN are like about 33 per cent of today's college graduates, they will not end their formal education when they get their bachelor's degrees. On they'll go—to graduate school, to a professional school, or to an advanced technological institution.

There are good reasons for their continuing:

► In four years, nowadays, one can only begin to scratch the surface of the body of knowledge in his specialty. To teach, or to hold down a high-ranking job in industry or government, graduate study is becoming more and more useful and necessary.

► Automation, in addition to eliminating jobs in unskilled categories, will have an increasingly strong effect on persons holding jobs in middle management and middle technology. Competition for survival will be intense. Many students will decide that one way of competing advantageously is to take as much formal education beyond the baccalaureate as they can get.

► One way in which women can compete successfully with men for high-level positions is to be equipped with a graduate degree when they enter the job market.

► Students heading for school-teaching careers will increasingly be urged to concentrate on substantive studies in their undergraduate years and to take methodology courses in a postgraduate schooling period. The same will be true in many other fields.

► Shortages are developing in some professions, *e.g.*, medicine. Intensive efforts will be made to woo more top undergraduates into professional schools, and opportunities in short-supplied professions will become increasingly attractive.

► "Skills," predicts a Presidential committee, "may become obsolete in our fast-moving industrial society. Sound education provides a basis for adjustment to constant and abrupt change—a base on which new skills may be built." The moral will not be lost on tomorrow's students.

In addition to having such practical motives, tomorrow's students will be influenced by a growing tendency to expose them to graduate-level work while they are still undergraduates. Independent study will give them a taste of the intellectual satisfaction to be derived from learning on their own. Graduate-style seminars, with their stimulating give-and-take of fact and opinion, will exert a strong

appeal. As a result, for able students the distinction between undergraduate and graduate work will become blurred and meaningless. Instead of arbitrary insistence upon learning in two-year or four-year units, there will be more attention paid to the length of time a student requires—and desires—to immerse himself in the specialty that interests him.

AND EVEN with graduate or professional study, education is not likely to end for your children.

Administrators in the field of adult education—or, more accurately, "continuing education"—expect that within a decade the number of students under their wing will exceed the number of undergraduates in American colleges and universities.

"Continuing education," says Paul A. McGhee, dean of New York University's Division of General Education (where annually some 17,000 persons enroll in around 1,200 non-credit courses) "is primarily the education of the already educated." The more education you have, the more you are likely to want. Since more and more people will go to college, it follows that more and more people will seek knowledge throughout their lives.

We are, say adult-education leaders, departing from the old notion that one works to live. In this day of automation and urbanization, a new concept is emerging: "time," not "work," is the paramount factor in people's lives. Leisure takes on a new meaning: along with golf, boating,



and partying, it now includes study. And he who forsakes gardening for studying is less and less likely to be regarded as the neighborhood oddball.

Certain to vanish are the last vestiges of the stigma that has long attached to "night school." Although the concept of night school as a place for educating only the illiterate has changed, many who have studied at night—either for credit or for fun and intellectual stimulation—have felt out of step, somehow. But such views are obsolescent and soon will be obsolete.

Thus far, American colleges and universities—with notable exceptions—have not led the way in providing continuing education for their alumni. Most alumni have been forced to rely on local boards of education and other civic and social groups to provide lectures, classes, discussion groups. These have been inadequate, and institutions of higher education can be expected to assume unprecedented roles in the continuing-education field.

Alumni and alumnae are certain to demand that they take such leadership. Wrote Clarence B. Randall in *The New York Times Magazine*: "At institution after institution there has come into being an organized and articulate group of devoted graduates who earnestly believe . . . that the college still has much to offer them."

When colleges and universities respond on a large scale to the growing demand for continuing education, the variety of courses is likely to be enormous. Already, in institutions where continuing education is an accepted role, the range is from space technology to existentialism to funeral direction. (When the University of California offered non-credit courses in the first-named subject to engineers and physicists, the combined enrollment reached 4,643.) "From the world of astronauts, to the highest of ivory towers, to six feet under," is how one wag has described the phenomenon.

SOME OTHER LIKELY FEATURES of your children, after they are graduated from tomorrow's colleges:

► They'll have considerably more political sophistication than did the average person who marched up to get a diploma in their parents' day. Political parties now have active student groups on many campuses and publish material beamed specifically at undergraduates. Student-government organizations are developing sophisticated procedures. Nonpartisan as well as partisan groups, operating on a national scale, are fanning student interest in current political affairs.

► They'll have an international orientation that many of their parents lacked when they left the campuses. The presence of more foreign students in their classes, the emphasis on courses dealing with global affairs, the front pages of their daily newspapers will all contribute to this change. They will find their international outlook useful: a recent government report predicts that "25 years from now, one college graduate in four will find at least part of

his career abroad in such places as Rio de Janeiro, Dakar, Beirut, Leopoldville, Sydney, Melbourne, or Toronto."

► They'll have an awareness of unanswered questions, to an extent that their parents probably did not have. Principles that once were regarded (and taught) as incontrovertible fact are now regarded (and taught) as subject to constant alteration, thanks to the frequent toppling of long-held ideas in today's explosive sciences and technologies. Says one observer: "My student generation, if it looked at the world, didn't know it was 'loaded'. Today's student has no such ignorance."

► They'll possess a broad-based liberal education, but in their jobs many of them are likely to specialize more narrowly than did their elders. "It is a rare bird today who knows all about contemporary physics and all about modern mathematics," said one of the world's most distinguished scientists not long ago, "and if he exists, I



haven't found him. Because of the rapid growth of science it has become impossible for one man to master any large part of it; therefore, we have the necessity of specialization."

► Your daughters are likely to be impatient with the prospect of devoting their lives solely to unskilled labor as housewives. Not only will more of tomorrow's women graduates embark upon careers when they receive their diplomas, but more of them will keep up their contacts with vocational interests even during their period of child-rearing. And even before the children are grown, more of them will return to the working force, either as paid employees or as highly skilled volunteers.

DEPENDING UPON THEIR OWN OUTLOOK, parents of tomorrow's graduates will find some of the prospects good, some of them deplorable. In essence, however, the likely trends of tomorrow are only continuations of trends that are clearly established today, and moving inexorably.

Who will pay—and how?

WILL YOU BE ABLE to afford a college education for your children? The tuition? The travel expense? The room rent? The board?

In addition:

Will you be able to pay considerably more than is written on the price-tags for these items?

The stark truth is that you—or somebody—must pay, if your children are to go to college and get an education as good as the education you received.

HERE is where colleges and universities get their money:

From taxes paid to governments at all levels: city, state, and federal. Governments *now* appropriate an estimated \$2.9 billion in support of higher education every year. *By 1970* government support will have grown to roughly \$4 billion.

From private gifts and grants. These *now* provide nearly \$1 billion annually. *By 1970* they must provide about \$2.019 billion. Here is where this money is likely to come from:

Alumni.....	\$ 505,000,000 (25%)
Non-alumni individuals.....	505,000,000 (25%)
Business corporations.....	505,000,000 (25%)
Foundations.....	262,000,000 (13%)
Religious denominations.....	242,000,000 (12%)
Total voluntary support, 1970..	\$2,019,000,000

From endowment earnings. These *now* provide around \$210 million a year. *By 1970* endowment will produce around \$333 million a year.

From tuition and fees. These *now* provide around \$1.2 billion (about 21 per cent of college and university funds). *By 1970* they must produce about \$2.1 billion (about 23.5 per cent of all funds).

From other sources. Miscellaneous income *now* provides around \$410 million annually. *By 1970* the figure is expected to be around \$585 million.

These estimates, made by the independent Council for Financial Aid to Education*, are based on the "best available" estimates of the expected growth in enrollment in America's colleges and universities: from slightly less than 4 million this year to about 6.4 million in the

academic year 1969-70. The total income that the colleges and universities will require in 1970 to handle this enrollment will be on the order of \$9 billion—compared with the \$5.6 billion that they received and spent in 1959-60.

WHO PAYS?

VIRTUALLY EVERY SOURCE of funds, of course—however it is labeled—boils down to you. Some of the money, you pay directly: tuition, fees, gifts to the colleges and universities that you support. Other funds pass, in a sense, through channels—your church, the several levels of government to which you pay taxes, the business corporations with which you deal or in which you own stock. But, in the last analysis, individual persons are the source of them all.

Hence, if you wished to reduce your support of higher education, you could do so. Conversely (as is presumably the case with most enlightened parents and with most college alumni and alumnae), if you wished to increase it, you could do that, also—with your vote and your check-book. As is clearly evident in the figures above, it is essential that you substantially increase both your direct and your indirect support of higher education between now and 1970, if tomorrow's colleges and universities are to give your children the education that you would wish for them.

THE MONEY YOU'LL NEED

SINCE IT REQUIRES long-range planning and long-range voluntary saving, for most families the most difficult part of financing their children's education is paying the direct costs: tuition, fees, room, board, travel expenses.

These costs vary widely from institution to institution. At government-subsidized colleges and universities, for



*To whose research staff the editors are indebted for most of the financial projections cited in this section of their report. CFAE statisticians, using and comparing three methods of projection, built their estimates on available hard figures and carefully reasoned assumptions about the future.

example, tuition fees for state residents may be non-existent or quite low. At community colleges, located within commuting distance of their students' homes, room and board expenses may consist only of what parents are already paying for housing and food. At independent (non-governmental) colleges and universities, the costs may be considerably higher.

In 1960-61, here is what the *average* male student spent at the *average* institution of higher education, including junior colleges, in each of the two categories (public and private):

	Public Institutions	Private Institutions
Tuition.....	\$179	\$ 676
Board.....	383	404
Room.....	187	216
Total.....	\$749	\$1,296

These, of course, are "hard-core" costs only, representing only part of the expense. The *average* annual bill for an unmarried student is around \$1,550. This conservative figure, provided by the Survey Research Center at the University of Michigan for the U.S. Office of Education, does not include such items as clothing. And, as we have attempted to stress by italicizing the word "*average*" wherever it appears, the bill can be considerably higher, as well as somewhat lower. At a private college for women (which is likely to get relatively little money from other sources and must therefore depend heavily upon tuition income) the hard-core costs alone may now run as high as \$2,600 per year.

Every parent must remember that costs will inevitably rise, not fall, in the years ahead. In 1970, according to one estimate, the cost of four years at the *average* state university will be \$5,800; at the *average* private college, \$11,684.

HOW TO AFFORD IT?

SUCH SUMS represent a healthy part of most families' resources. Hard-core costs alone equal, at public institutions, about 13 per cent of the average American family's annual income; at private institutions, about 23 per cent of average annual income.

How do families afford it? How can *you* afford it?

Here is how the typical family pays the current average bill of \$1,550 per year:

Parents contribute.....	\$950
Scholarships defray.....	130
The student earns.....	360
Other sources yield.....	110

Nearly half of all parents begin saving money for their children's college education well before their children are ready to enroll. Fourteen per cent report that they borrow money to help meet college costs. Some 27 per cent take on extra work, to earn more money. One in five mothers does additional work in order to help out.

Financing the education of one's children is obviously,

for many families, a scramble—a piecing-together of many sources of funds.

Is such scrambling necessary? The question can be answered only on a family-by-family basis. But these generalizations do seem valid:

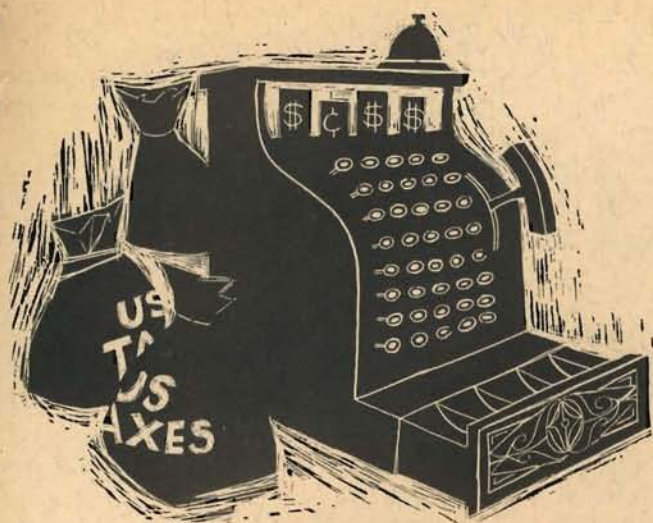
► Many parents *think* they are putting aside enough money to pay most of the costs of sending their children to college. But most parents seriously underestimate what these costs will be. The only solution: Keep posted, by checking college costs periodically. What was true of college costs yesterday (and even of the figures in this report, as nearly current as they are) is not necessarily true of college costs today. It will be even less true of college costs tomorrow.

► If they knew what college costs really were, and what they are likely to be in the years when their children are likely to enroll, many parents *could* save enough money. They would start saving earlier and more persistently. They would gear their family budgets to the need. They would revise their savings programs from time to time, as they obtained new information about cost changes.

► Many parents count on scholarships to pay their children's way. For upper-middle-income families, this reliance can be disastrous. By far the greatest number of scholarships are now awarded on the basis of financial need, largely determined by level of family income. (Colleges and other scholarship sources are seriously concerned about the fact, indicated by several studies, that at least 100,000 of the country's high-school graduates each year are unable to attend college, primarily for financial reasons.) Upper-middle-income families are among those most seriously affected by the sudden realization that they have failed to save enough for their children's education.

► Loan programs make sense. Since going to college sometimes costs as much as buying a house (which most families finance through long-term borrowing), long-term





repayment of college costs, by students or their parents, strikes many people as highly logical.

Loans can be obtained from government and from private bankers. Just last spring, the most ambitious private loan program yet developed was put into operation: United Student Aid Funds, Inc., is the backer, with headquarters at 420 Lexington Avenue, New York 17, N.Y. It is raising sufficient capital to underwrite a reserve fund to endorse \$500 million worth of long-term, low-interest bank loans to students. Affiliated state committees, established by citizen groups, will act as the direct contact agencies for students.

In the 1957-58 academic year, loans for educational purposes totaled only \$115 million. Last year they totaled an estimated \$430 million. By comparison, scholarships from all sources last year amounted to only \$160 million.

IS THE COST TOO HIGH?

HIGH AS THEY SEEM, tuition rates are bargains, in this sense: They do not begin to pay the cost of providing a college education.

On the national average, colleges and universities must receive between three and four additional dollars for every one dollar that they collect from students, in order to provide their services. At public institutions, the ratio of non-tuition money to tuition money is greater than the average: the states typically spend more than \$700 for every student enrolled.

Even the gross cost of higher education is low, when put in perspective. In terms of America's total production of goods and services, the proportion of the gross national product spent for higher education is only 1.3 per cent, according to government statistics.

To put salaries and physical plant on a sound footing, colleges must spend more money, in relation to the gross national product, than they have been spending in the past. Before they can spend it, they must get it. From what sources?

Using the current and the 1970 figures that were cited earlier, tuition will probably have to carry, on the average, about 2 per cent more of the share of total educational costs than it now carries. Governmental support, although increasing by about a billion dollars, will actually carry about 7 per cent less of the total cost than it now does. Endowment income's share will remain about the same as at present. Revenues in the category of "other sources" can be expected to decline by about .8 per cent, in terms of their share of the total load. Private gifts and grants—from alumni, non-alumni individuals, businesses and unions, philanthropic foundations, and religious denominations—must carry about 6 per cent more of the total cost in 1970, if higher education is not to founder.

Alumnae and alumni, to whom colleges and universities must look for an estimated 25 per cent (\$505 million) of such gifts: please note.

CAN COLLEGES BE MORE EFFICIENT?

INDUSTRIAL COST ACCOUNTANTS—and, not infrequently, other business men—sometimes tear their hair over the "inefficiencies" they see in higher education. Physical facilities—classrooms, for example—are in use for only part of the 24-hour day, and sometimes they stand idle for three months in summertime. Teachers "work"—i.e., actually stand in the front of their classes—for only a fraction of industry's 40-hour week. (The hours devoted to preparation and research, without which a teacher would soon become a purveyor of dangerously outdated misinformation, don't show on formal teaching schedules and are thus sometimes overlooked by persons making a judgment in terms of business efficiency.) Some courses are given for only a handful of students. (What a waste of space and personnel, some cost analysts say.)

A few of these "inefficiencies" are capable of being curbed, at least partially. The use of physical facilities is being increased at some institutions through the provision of night lectures and lab courses. Summer schools and year-round schedules are raising the rate of plant utilization. But not all schools are so situated that they can avail themselves of even these economies.

The president of the Rochester (N.Y.) Chamber of Commerce observed not long ago:

"The heart of the matter is simply this: To a great extent, the very thing which is often referred to as the 'inefficient' or 'unbusinesslike' phase of a liberal arts college's operation is really but an accurate reflection of its true essential nature . . . [American business and industry] have to understand that much of liberal education which is urgently worth saving cannot be justified on a dollars-and-cents basis."

In short, although educators have as much of an obligation as anyone else to use money wisely, you just can't run a college like a railroad. Your children would be cheated, if anybody tried.

In sum:

WHEN YOUR CHILDREN go to college, what will college be like? Their college will, in short, be ready for them. Its teaching staff will be competent and complete. Its courses will be good and, as you would wish them to be, demanding of the best talents that your children possess. Its physical facilities will surpass those you knew in your college years. The opportunities it will offer your children will be limitless.

If.

That is the important word.

Between now and 1970 (a date that the editors arbitrarily selected for most of their projections, although the date for your children may come sooner or it may come later), much must be done to build the strength of America's colleges and universities. For, between now and 1970, they will be carrying an increasingly heavy load in behalf of the nation.

They will need more money—considerably more than is now available to them—and they will need to obtain much of it from you.

They will need, as always, the understanding by thoughtful portions of the citizenry (particularly their own alumni and alumnae) of the subtleties, the sensitiveness, the fine balances of freedom and responsibility without which the mechanism of higher education cannot function.

They will need, if they are to be of highest service to your children, the best aid which you are capable of giving as a parent: the preparation of your children to value things of the mind, to know the joy of meeting and overcoming obstacles, and to develop their own personal independence.

Your children are members of the most promising American generation. (Every new generation, properly, is so regarded.) To help them realize their promise is a job to which the colleges and universities are dedicated. It is their supreme function. It is the job to which you, as parent, are also dedicated. It is *your* supreme function.

With your efforts and the efforts of the college of tomorrow, your children's future can be brilliant. If.



"The College of Tomorrow"

The report on this and the preceding 15 pages is the product of a cooperative endeavor in which scores of schools, colleges, and universities are taking part. It was prepared under the direction of the group listed below, who form EDITORIAL PROJECTS FOR EDUCATION, a non-profit organization associated with the American Alumni Council. Copyright © 1962 by Editorial Projects for Education, Inc., 1707 N Street, N.W., Washington 6, D.C. All rights reserved; no part of this supplement may be reproduced without express permission of the editors. Printed in U.S.A.

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*Harold Taylor, former president of Sarah Lawrence College, is recognized as one of the most provocative and original thinkers in the field of American education. Educated at the Universities of Toronto and London, Dr. Taylor was teaching philosophy at the University of Wisconsin when he was appointed president of Sarah Lawrence at the age of 30. Following his retirement in 1959, he traveled in Asia and Russia on a Ford Foundation grant. He is the author of *Art and the Intellect* and *On Education and Freedom*.*

As one of the speakers on the University's Assembly Series, Dr. Taylor gave a penetrating, no-holds-barred analysis of the contemporary college student and the world he inhabits. This condensed version is just a sample of what Dr. Taylor had to say.

THE WORLD

OF THE AMERICAN STUDENT

I LIKE TO USE THE WORD "WORLD" in some specific ways. The first is in a peculiar way which I learned from a director of military research in the Defense Department, who said, "My job is to relate our research to reality." He then went on to describe what he thought of as reality, saying, "I live in a computer world in which the data are so complex and the problems so intricate that everything we do must be done in consideration of what the world will be like ten years from now."

To me, reality consists of a world which is ten years away, and one in which the political, moral, social, scientific, and intellectual factors are all so mixed together that one simple factor, such as the attitude of the Chinese Communists three years from now, may turn out to be the most important thing I have to put into my conception of reality.

Therefore, I am using the word partly in the sense of a world that is not yet in being, a world that is changing so fast and moving so swiftly into a future so complex that we can't predict it. All we can say about it is that ten years from now it will be widely different from the world in which we exist at this moment. It will be widely different because of what we do right now. There has been no other time when this particular conception of the world existed—so unreal when you're living in it, because it is changing so quickly.

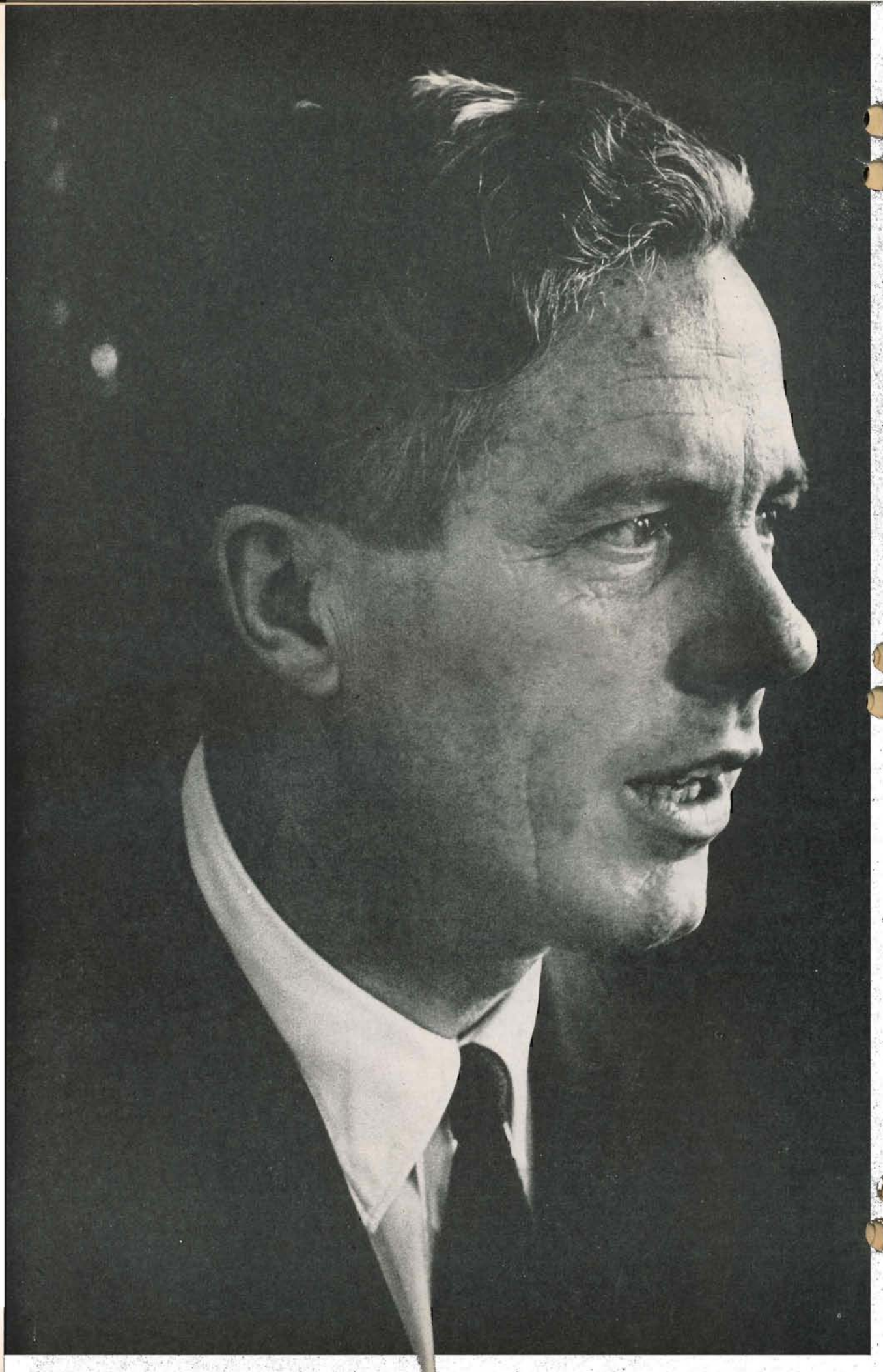
I also think of the private world of the American student and the rest of us who live in that world with him as being a particular state which he constructs for himself. I want to say something about that world, too. But the student's private world is conditioned by the world in which everyone lives in the United States, and I want to

talk about some of its characteristics. In the beginning, I would use some familiar language and state that we are now in an organization society—a fact celebrated by the sociologists, particularly by David Riesman, and by people like Bill Whyte. Like everything else, when you take something simple and precious and important and organize it, you're quite capable of destroying the thing that you built the organization in order to encourage and forward and enhance.

This happens in schools and colleges in small communities. The intimacy and sense of personal relationship which can exist only where people live together in self-consciously small communities gets organized out of existence as soon as the organization becomes so large that there is no control of the very thing they were organized to perform.

This I find to be true about education—that the serious, important center of education may very well be lost in the way it gets itself organized. In the organization society in America, we've organized out of our personal lives most of the things that make those personal lives important. We have a cluttered, hurried, over-organized mass society, consisting of big business, big military, big labor, big education, big economy, big problems. In order to cope with them, we set up massive organizations which remove the personal element.

I THINK THIS IS A CHARACTERISTIC of the contemporary American world. It is a public relations culture adapted to an organization society. We tend to have public relations programs for practically everything, including ourselves. Some college students act as their own public relations representatives in trying to make their own par-



I bring you the image of the university of the future.

There was once a professor who was so important and so mixed up with helping run the country, advising Mr. Kennedy, advising industrial corporations, and running vast research projects that he couldn't give a weekly seminar for 12 students, his only teaching responsibility.

He went to the Dean and said, "Dean, I'm afraid I can't make it—I've got to run the world and all these things. I will tape what I have to say to the seminar, and the tapes can be played each week at the appropriate time. At the end of the term, I'll give the examinations and one of my assistants can mark them."

The Dean agreed. Some four weeks later, the professor found himself inadvertently on his own campus. He thought it only decent to go along and see how the class was making out.

He went to the appropriate room at the appropriate time and opened the door. There, on the front desk, was the tape recorder transmitting his voice. There, on 12 chairs grouped around the table, were 12 other tape recorders.

ticular character attractive. Within the organization society one must move upwards toward the status position by being nice to everyone and by seeking approval. I find this in high school students who seek the kind of approval which can be obtained only by having the right kind of extracurricular records, by having study aids, and by getting into what is called a prestige college.

The attitudes of the public relations culture have infiltrated universities until they have become bureaucracies for the dissemination of information, rather than homes for the spirit of learning. We have become so concerned about the organization of our lives that we have forgotten that some of the most important values in life are those which are deeply personal and which raise the questions of "ultimate concern," either from a theological and religious point of view or from a social and political one.

THESE QUESTIONS ARE STIRRING within the American student body and turning up in projects reaching from studies of peace and war to action on the race issue and on what you could call educational policy or the improvement and enlightenment of the university community.

I would like to put before you some contrasts in which this notion of an over-organized and anonymous society is in conflict with other causes students themselves are supporting.

For example, last spring in Washington, 400 students came from all over the United States to a meeting on the Peace Corps, at their own expense, on their own time, and with their own ideas, because they felt that they, as young-

sters in this country, had something to offer their government, not only in volunteering for the Peace Corps, but in planning the educational content and the methods by which the Peace Corps should be developed. They went there with this form of idealism, with this kind of intellectual energy, and, over a period of three days, worked out a program which they presented to their government and which was useful and important in the construction of the Peace Corps.

WHILE THESE 400 STUDENTS WERE MEETING in Washington, 40,000 other students were meeting in Fort Lauderdale on a different venture. In about that proportion, they represent the attitudes of the American community at large. The 40,000 were celebrating the American dream by climbing lamp posts, molesting Fort Lauderdale citizens, and spending a million and a half dollars of their parents' and their own money.

The 400 students in Washington represent a set of values which it is the function of education to encourage, enhance, and stimulate. Those students found very few persons who wished to help them get to Washington or to help them formulate their ideas before they got there. I present this as an example of what happens when the university community is not reaching young people at the level of their moral values and personal commitments.

I bring you another contrast. On one hand we have those young Negro students who, with courage, patience, and dignity, have found new ways to break the pattern of segregation in the South. With great risk to their own futures,

with immediate risk to their own safety and comfort and sometimes their lives, they have shown the way to the older generation, to the student body of America, and to the university community at large, in breaking new ground on our greatest moral domestic question. Their example has stirred the idealism in young people all over the country. They have broken new ground in that new ideas are now emerging in the world of the American student; students can take responsibility—not in exactly the same way as the sit-in strikers or the freedom riders, but in other ways on their own campuses and in their own communities.

While those youngsters were operating on behalf of the American people, the fraternity and sorority system of the country was going on its happy way as a built-in institutional educational posture toward segregation, discrimination, and all the false middle-class values of that segregation pattern. It's linked, of course, to acceptance of the *status quo*, which, with educational encouragement, makes young people feel that it's perfectly all right to segregate themselves in special groups of the white, the well-to-do, and the Protestant.

WHEN WE LOOK AT THE INSTITUTIONAL STRUCTURE in which the American student lives, we find that there are three major parts to the apparatus. In the first place, there's the over-organized academic apparatus itself. Facts are collected into textbooks, condensed and distributed in lectures, and recollected in examinations. Students are graded like eggs and awarded something called "academic credit," at three credits a throw, for sitting still, listening, and making notes over a period of 15 weeks at a time.

In order to run the academic machinery so that teachers and students can be moved in and out like so many replacement parts, curriculum committees of university faculties meet regularly to rearrange the subject matters and sets of requirements.

Next is the administrative structure, which consists of deans, departmental chairmen, vice presidents, provosts, chancellors, and presidents. They never see students and seldom see faculty members, except on business matters, such as leaves of absence, salaries, housing, parking permits, football tickets, and research budgets.

Third is something that's called the student personnel section, which consists of counseling and psychological services designed to give therapy to those who are either sterilized or spiritually and emotionally exhausted by the academic apparatus.

Finally comes the student's social life, usually dominated by the sorority and fraternity pattern, which encourages snobbish attitudes, and the intercollegiate athletic complex, in which men learn how to move from being low-paid amateurs to highly paid professionals while thousands cheer.

In this situation, it is no wonder that the student culture creates its own values and its own standards. It's no wonder that there is cheating on examinations, throwing of basketball games, competing for grades, choosing of courses in terms of whether one can get a good grade, and jostling for social position in an upward struggle to occupy a status position in American society. All these

are considered normal collegiate practices by the American student. I don't think he can be blamed for this. In the absence of genuine intellectual and moral leadership from the university, he accepts the values of society around him. He does so unthinkingly, until one day he comes up against himself going the other way, finds the organization society around him boring and unrewarding, and raises questions about where he is going.

One of the basic problems for the American student in the world in which he lives—both on and off his campus—is the problem of how to be honest with himself about what he really thinks and what he really feels. The system itself teaches him to take secondhand notions of how one should feel in the presence of a given painting and how one should respond to a given book. He is given a lecture about the book before he can find out for himself what is in it.

So much of education consists of giving the wrong books to the wrong students at the wrong time and letting them read them in the wrong way. The way to read a book is to come close to the author by absorbing his ideas within oneself, without the obligation of having to answer questions before you really have had a chance to let the author speak to you directly.

It's also true that so much of what students are given consists of the general survey of what is known about a given field, presented through lectures and textbooks so that the student never has the chance to work out for himself what are the truths to which the philosopher, social scientist, and natural scientist have come. This is the true meaning of education to a student—to build a world of his own, not to take secondhand a world which is handed down from year to year through the institutions of education. Nowhere is this more apparent than in the way in which we concern ourselves with the creative arts in the university.

THE CREATIVE ARTS ARE TAUGHT at secondhand in appreciation courses, with paintings, sculpture, and architecture pointed out, so that there is very little opportunity for the student himself to engage in the process that created the art. This is a tragedy in the American university community, where the widest opportunities are available in the most interesting and imaginative and creative enterprises in all the arts.

As a regular part of the curriculum students should be asked to dance, to write poems, to write novels, to write plays and to act them. This is intellectually and esthetically respectable, but it is very seldom put into an academic curriculum. The word *academic* itself is not coincident with the intellectual, moral, or esthetic—in fact, it's the converse—and the term *academic* is in disrepute among artists simply because it destroys the creative art itself, by making a report about the art rather than giving the student an opportunity to engage in it.

In order to become honest with oneself and one's true feelings, it is necessary to move to a point of view through practical experience in the art forms and in the intellectual forms (the social sciences and natural sciences and the humanities). It is necessary to search for those private truths which can come only from the student committed

to that inquiry. Whenever you give students answers ahead of time, you destroy the possibility of their own honest search. This is one of the root problems in the situation.

Another problem is the increasing detachment of the university professor from the student and his concerns. Within the organization society we have the university community, and within the university community we have organization men—those men who move upward in the bureaucracy by a certain agreed-upon pattern that has been spelled out by the sociologist. This pattern consists of publishing a certain amount of material, behaving oneself in a certain committee sense, and being there when the promotions are ready. This is what you do in business corporations, as is widely recorded in novels and in movies. The movie people haven't gotten around to the university professor yet, but when they do, I believe we'll find that he will turn out to be an organization man, too.

He is organized within his hierarchical system so that when he is made a full professor he teaches less and less. The ultimate reward of the university would be never to have to teach. The freshmen are taught by graduate assistants, who themselves have been taught by other graduate assistants. Thus the system is perpetuated.

The organization society outside of the university has been taking the sting and the flavor and the bite and the controversy out of life. Inside the university community, aside from small, nuclear groups of students who care and who dare to commit themselves, we have wide areas of disregard.

The Liberal Arts College of Washington University is the place where students should be taught how to improve the quality of American democracy by working on the race issue, where they should be directly taught how to engage in political controversy by being informed about politics and by knowing where the people are who are doing the things which are anti-democratic and where the people are who are themselves democratic in instinct and are trying to move the society upward to higher levels of achievements.

IT IS A FUNCTION OF THE UNIVERSITY to encourage social change and to find within itself the instruments of social change both for the world and for its own society. It should be designed to teach its students how to be forceful, provocative, creative thinkers about politics, the arts, literature, and their country, and to use those attitudes of generosity, passion, affection, and tenderness with each other, rather than competing with each other in order to rise in a social system.

It's natural for those on the outside who see this movement toward a democracy, higher and more far-reaching in its enlightenment than anything we now have, to attack the schools and colleges and to try to stop the students from having any involvement with politics at all.

The young people of this country understand many things at a higher level than do their elders. I have nothing but deep respect for those students who are studying politics and are in action programs on moral and political

issues. They are carrying matters along under their own steam. Since, however, the conservative attitudes of the institutions do not encourage these attitudes on the part of the students, we find that they are going it alone much more than should be necessary.

What, then, do we prove about the way in which the world of the American student can be furnished with richer esthetic, moral, and intellectual resources than the world in which they now find themselves?

We need to look at the curriculum, but not just to determine whether it has presented appropriate amounts of scientific discipline and the humanities.

This is not the way to get educated people—to think in terms of how much of each subject they must study. The way to become deeply educated is to become so deeply involved in the concern for gaining knowledge in an area that has concern in it that one will do anything in order to learn more about it.

Therefore, the design for education must be one in which the world of the student is filled with courageous attitudes. The more requirements and prerequisites you put in the longer you postpone the true meaning of education for each student.

What we must do is give to our freshmen the very best teachers so that they will gain insight into what it means to work with a man of keen scholarship—what it means to work with a man who understands students as individuals.

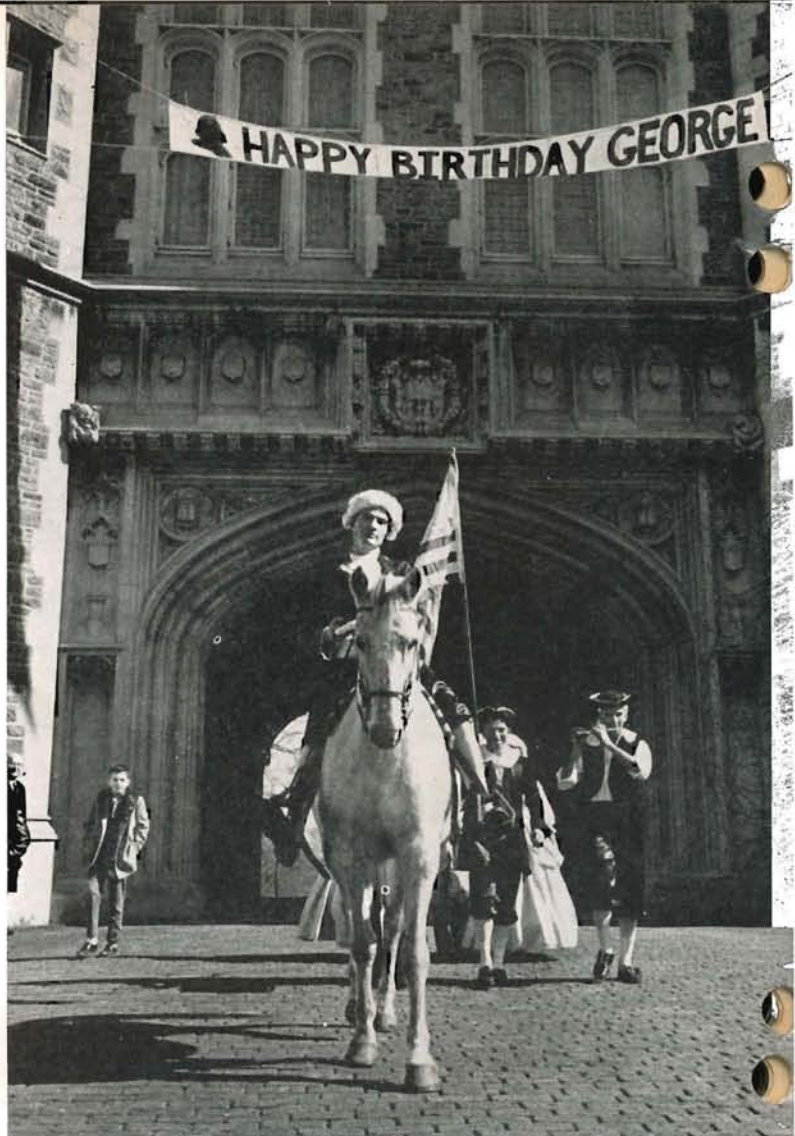
The people who talk about American education disparagingly usually compare it with education in the Soviet Union. All the Soviets are doing in order to achieve the effects they're getting is to put in a heavy academic program of the European sort and enough money to have first-rate teachers in every university teaching students individually. Until we realize that this is the secret of education—to have good teachers who can work directly on personal terms with individual students—we are not going to get the quality of education our young people need. We must make a world in which the student has available to him the resources of intellect which only good scholars and good teachers who care about students can give.

This seems to me to be the first reform. To carry it out will require massive public aid from the federal government and from the states and private sources to double and triple the present budgets of the universities. We're running out of shoestrings.

UNtil we look at the student as a person, until we rearrange his world so that he becomes conscious of the possibilities in life, until he is given a chance to work directly on the original sources of human knowledge, until he is given the opportunity to pursue his own truth in his own way, under the guidance of interested and compassionate teachers, we are not going to be even close to the center of where America needs improvement.

But when we get there, we will find the students there waiting for us. And in the absence of our attention to them, they are founding their own groups to make their own world—a world in which we can benefit by joining with them under their supervision.

The students stage an impromptu celebration on Washington's Birthday—complete with George himself.



Birthday Party

ON February 22, the anniversary of the founding of Washington University, the students got together and gave the University a birthday party.

All in all it was quite a party. About 1000 persons gathered in the Quadrangle to enjoy the skits, cheer the speeches, and welcome George Washington, himself. Hal Daub, president of the Student Senate, portrayed the first President, complete with authentic Revolutionary costume and white horse. For the grand finale, George and Martha led a stately minuet that evolved suddenly into the Twist.



THE SPECIAL SECTION on "The College of Tomorrow" in this issue poses a great many vital questions about the role of the college in contemporary America and about what that role is likely to be in the future. The answers given are naturally tentative. However, while they are frankly guesses, they are *educated* guesses.

As a companion piece to this survey of the collegiate scene of the future, we conceived the idea of attempting to get a look at the same subject from the students' viewpoint. After all, *they* will be living in this future we're talking about.

To try to get at this viewpoint, we asked eight Washington University students to sit down and talk about the subject. To get as broad a viewpoint as possible, we chose students from seven different countries. Taking part in the conversation were two American students and one each from Great Britain, the Soviet Union, Tunisia, China, Thailand, and Ghana. All of them are currently students at Washington University; most of them have been students at other colleges and universities all over the world.

The group spent about three hours in conversation. The tape recorder taking it all down inhibited the flow of talk for perhaps 30 seconds; then everybody forgot it was in the room. Youth is immediate, and the conversation always got back somehow to the here and now—to the actual living university of today on which the college of tomorrow will be built. Still, much of what they had to say could provide valuable material for the architects of tomorrow's colleges.

This, then, is a transcript of portions of a free-wheeling conversation by a group of college students about colleges—here and in other lands, in the present and in the future.

THE STUDENT VIEW

A group of Washington University students from near and far talk about the college of today and the college of tomorrow.



THE PARTICIPANTS

BRADLEY BINNINGTON

Liberal Arts junior from Kirkwood, Missouri

HARRIET DAWES

Liberal Arts freshman from Oxford, England

PATRICIA FRENCH

Liberal Arts junior from Dundee, Illinois

SERGEI P. IVANOV

Graduate student from the Soviet Union

KAWI KAMBHU

Engineering School senior from Thailand

MAJID KRIA

School of Business student from Tunisia

AKOMEA POKU-KANKAM

Liberal Arts senior from Ghana

WILLIAM M. S. YEN

Post-doctoral student from China (via Venezuela)

FRANK O'BRIEN, *Editor*

*Maybe we should just demand
a lot more of our freshmen and
weed out the less intellectual
students.*

PAT FRENCH



*When a person enters
college, he sometimes has no
specific goal. He should
have more variety of courses
so he can make up his mind.*

KAWI KAMBHU

O'BRIEN: First of all, I'd like to ask this group's opinion of American colleges, compared to colleges in other parts of the world. What is the role of the college in America? How good a job do you think the colleges are doing?

DAWES: In your American colleges, you give lectures. I have noticed that the people who get the highest grades are those who feed back what has been said to them in the lectures and in the books they have read. The role of the American college is to enable everyone to have the same education. There is no idea of specialized education for an individual with special talent later on. I think that is the most important thing about American colleges.

FRENCH: I'm afraid I have to agree with Harriet. What she was really saying was that she thinks the real role of education in America is now being played by the graduate school and that American college education is getting like American high school education used to be. It's something that you have without its actually meaning very much. I am afraid that this is a terrible thing to say as an American student, but I feel very definitely that we are being spoon-fed, and I think we are capable of more.

BINNINGTON: Perhaps in some of the earlier courses that is true, but in the seminars that are now being offered it is not the case. I know from personal experience that the history seminars are not spoon-fed. Right now in the medieval seminar we are going through actual historical documents and digging out for ourselves what is in them. Then we sit down and talk about them. Professor Riesenbergs certainly doesn't point out everything to us; there's a lot of opportunity to put ourselves into it and to work ourselves. I don't know whether this is so prevalent in the big lecture courses, but in the seminars I really think there is an opportunity to educate yourself and to develop your own talents of analysis and observation.

FRENCH: Yes, the opportunity is there. Anybody who really wants an education can get one.

DAWES: I heard a student who is very clever complaining because one of her professors didn't give them a lecture, but just came into class and asked, "Are there any questions?" and that was it. You had to do your own work, and she was complaining about it.

O'BRIEN: Do you think American education is too oriented toward vocational training rather than toward broad, liberal education?

BINNINGTON: I would say it's too liberal. You cannot learn everything or even a small portion about every subject. If you had only two courses taught by seminars you could learn more about the subjects. Personally, I think that would be of greater value than if you had three or four courses where you barely scratched the surface.

KAMBHU: I disagree, because when a person enters college, he sometimes has no specific goal. He should have

more variety of courses to help him make up his mind. His high school background will help him in the decision, too. If you know high school physics, you can use it all the way up almost to graduate school. When you go on to graduate school, then you can specialize in certain fields.

YEN: I came from a small college that takes pride in giving a very broad and liberal education. However, it appeared to me that all the courses I took for my first three years were repeats from my high school subjects. Consequently, I felt that I wasn't really gaining anything. It came rather as a shock, when I was ready to go on to graduate work, to realize that I really didn't know my physics. It would have been much better, as far as my professional training goes, if I had obtained four stiff years of physics and nothing else when I was an undergraduate.

KRIA: American colleges are different in many ways from universities in my part of the world. We have hardly any choice as far as the courses are concerned. Also, we have to study subjects which are directly related to our field of specialization—a science major does not study history or the humanities.

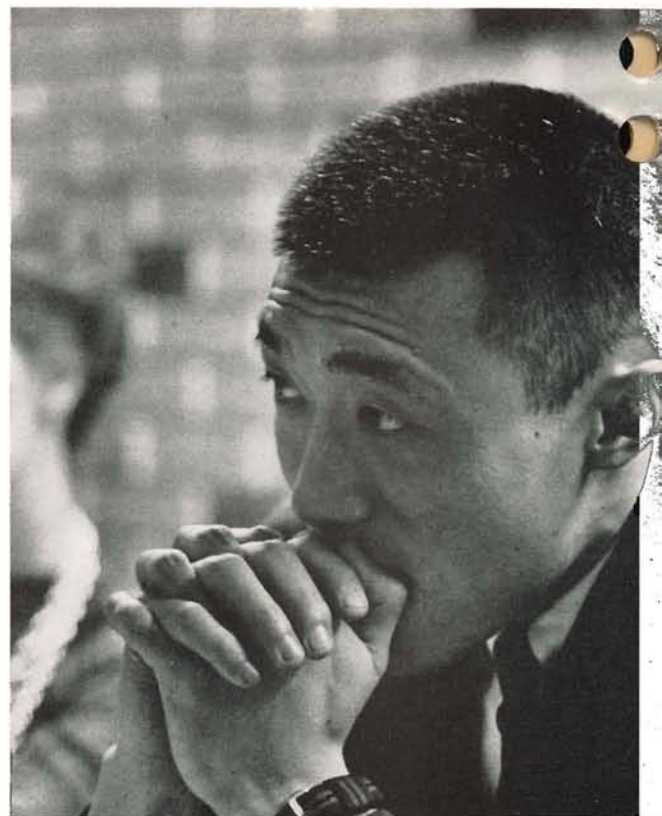
O'BRIEN: Sergei, how do you think American colleges compare with those in the Soviet Union?

IVANOV: I have been only six months in this country and have only superficial knowledge of higher education in the United States, but I can venture to make some remarks. It goes without saying that the role of the college in American life is very significant. Many things I have seen here confirm this, such as the successful launching of the Friendship 7 with John Glenn on board. By the way, on behalf of the Soviet students, professors, and myself personally, I congratulate you on this great achievement. But it does seem to me that you sometimes overemphasize managerial and business values and underestimate contributions made by men of higher intellect and specialized professional knowledge. Yet, at present, intellectuals and professionals are the key people in efforts to develop technology and progress—and I would say that progress and building means peace.

POKU-KANKAM: Coming from Ghana, a place where we have been oriented to the British system of education, let me say that the impression you get of American colleges first of all is that of the magnificent buildings and all the modern equipment you can lay your hands on. Then, you don't look at the buildings alone, you look forward to meeting people. It is there that you find what we call a lack of communication—a lack of communication among students. You stick to the notes and you stick to the textbooks, and you can pass a course, but is that all? There are so many things we can learn by communicating among ourselves. You can learn not only in the classroom, from the professor alone, but also by having discussions among students in the same course, or even outside. You can even

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BILL YEN



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MAJID KRIA

go to a senior student who passed a course two or three years ago, and he can give you a broad perspective of what you should expect in the course you're going to take. But there is a clear-cut division between graduate school and undergraduate school, and there is little communication between them. You just drift with the crowd to a point where you almost get lost, especially if you are a foreign student.

O'BRIEN: What do the rest of you think? Is there poor communication among students or between students and faculty at Washington University?

FRENCH: Very definitely, and it's not just the foreign students or even new students. I think this condition exists all over. I learn so much more from courses in which the professor will take time to tell you what he thinks you are doing right or wrong. I find myself going through many courses and getting A's and B's and never being able to evaluate myself because I have no criteria, no standard. I don't talk to people who have written the same kind of papers; my instructor doesn't tell me where I have fallen short or what I have written or said that was good. It's scary, sometimes.

BINNINGTON: That's poor. You either want to get good grades or you want to learn something, and sometimes you have to mix them together so you can get good grades and pass all the courses and learn a little bit of everything.

FRENCH: Is this situation remedied in other countries? Are there other schools in which there is communication?

DAWES: At Oxford you go to lectures, but where you learn most is in direct communication with your personal tutor. He has at most two students. You write an essay a week. You go to the tutor. You read it aloud. He tells you how good it is or how not good it is, suggests new ideas, new books to read, and that's about all. You read on your own during vacation and they don't give any grades at all. The only grades you get are on two exams—one called prelims and one called finals. The prelims are given usually in your first year and finals at the end of three or four years.

YEN: Personally, I feel that the majority of undergraduates are really not interested in broadening themselves. The majority just want to get a degree and that's all. You can witness this by the tremendous dropout rate from college to graduate school. However, I think that the American graduate school can be pitted against any graduate school in the world and come out way ahead.

BINNINGTON: Another difference is that in graduate school you are doing what you want to do normally or working in your main interest.

YEN: But the point of the matter is that you can't do this in undergraduate school. That's not the way it is set up.

POKU-KANKAM: One has to be brought into contact with the various fields to fix interest, and most of the

schools all over the world are just sort of an introduction to knowledge. In the majority of countries, the great weeding-out process occurs shortly after primary school; consequently, only a selected few get to go to high school. This, of course, is not the case in the United States. I think there is certainly a place where one must be introduced to knowledge, and in the United States this happens to be in college.

DAWES: In England it's terrible the ruction there is about children being chosen at age 11 to go to a state school or a state secondary school, where they usually learn more vocational subjects. This is not the absolute rule, but it's a general rule. At 11 they are separated, and from then on the child has to choose his way. Should you do that, or should you leave them all together until they are 18 and then separate them, or should you separate them at age 22 after they have been through college and then let them choose what they want to do?

O'BRIEN: Sergei, what is the method used in the Soviet Union to determine who will go on to higher education and who will not?

IVANOV: It is interesting to compare American colleges with those in our country. In the Soviet Union, public education is free, and grants are paid to students. At present, we have an enrollment of 2,600,000 students in our higher educational institutions. By 1980, it is envisaged that enrollment will rise to eight million. In a recent book prepared by the National Science Foundation and presented to President Kennedy, it was stated that at the BA level 57 per cent of Russian degrees are in science, engineering, medicine, and agriculture, compared to 25 per cent in the same fields in the United States. Three quarters of the Russian PhD candidates are in those fields, compared with 40 per cent in the United States. At present, the Soviet Union trains three times the number of engineers as the United States. If we want to see our children harmoniously well-versed people, we must pay more attention to such subjects as mathematics, physics, and, of course, languages. We must pay more attention to the humanities, also. Man cannot live by bread alone.

O'BRIEN: Do you think in the future our efforts should be channeled to producing more engineers and more technicians?

IVANOV: I would say that you will put more emphasis on educating for scientists and engineers. President Kennedy has said that the United States needs more engineers and technicians to cope with the problems that are facing the American people and American industry.

YEN: It's not a question of the number of engineers one turns out. It's more a question of how many the state or society can handle. I think that the number of engineers Soviet Russia is training at the moment find their use because Soviet industry and the whole Soviet nation is growing at a pretty good rate. I feel that in the case of the United States it would be downright stupid to try to turn out twice as many engineers as there are places for.



When a student is not interested in politics, then what do you expect of him? If he is not interested in the world around him, what do you expect of him?

AKOMEA POKU-KANKAM

The role of the American college is to enable everyone to have the same education.

HARRIET DAWES



POKU-KANKAM: This is a new age, a new life, a new technology. The new frontier is opening to trained engineers not only to work in America, but to go to any part of the world, to extend knowledge. So it's a new thing that has to be done. The Peace Corps is a striking example of how trained engineers can be of service.

KAMBHU: I think automation is the next step, and we'll need more technicians and engineers because automation is increasing right now.

IVANOV: In the past two or three decades, science and technology have moved forward at such a rapid pace that it's difficult to predict the limits of man's mastery over nature. That mastery depends upon scientists, engineers, technicians, professionals. With the help of these people, it will be possible to build in scientific and technical ways a good life for everybody on our earth. So I think that much emphasis must be placed on scientific training in the future and mainly in the colleges of the United States.

BINNINGTON: One thing here is a matter of values—how much value you want to put into humanities, how much you want to put into technical training, into science, including biological science. In our country, the emphasis on the humanities has apparently gone down somewhat. People are always saying that they're going to bring them back, but I doubt it, because there is a different type of personal involvement in the fields included in the humanities than there is in physical or biological science. The pleasure and satisfaction a person derives from these two general types is different. It's a matter of where you want to put the emphasis. I think there should be some emphasis given the humanities.

IVANOV: I agree with you. If we want to see our children become well-educated and broadly creative people, we must pay much attention to humanities and social sciences. If we want to live in peace as good neighbors, we must know not only the social events and processes which are taking place in the United States and the Soviet Union; we must understand the intentions, desires, dreams, and wishes of all people. Social sciences and humanities are indispensable tools for well-versed, creative people, and for promoting the cause of peace.

O'BRIEN: The next issue of the *Washington University Magazine* will include a special section about the college of tomorrow. If this group were given the opportunity to plan the Washington University of tomorrow, where would you start? What would you change?

BINNINGTON: I'd change required courses. I don't think students need to take these courses. They could choose the courses they like.

FRENCH: How do you know what you like until you've taken the course?

BINNINGTON: You have an idea of what you want to do in the future, what your field is.

DAWES: There are fields that suddenly open up once you're in college, like psychology—things you really haven't had a chance to explore in high school.

KRIA: It's very democratic not to have requirements; the students have the right to make a choice. In Europe, we do not have discussion of the schedule we have to take.

POKU-KANKAM: One of the most difficult problems for education to solve is to find out what the individual can produce. We are in an age of mass production, but human minds are such that you have to give them room for experiment and a chance to make recommendations. The main objective is to give a person a systematic education with emphasis on personal achievement—what a person can do without being forced to do it.

O'BRIEN: Bill, isn't this what happens in graduate school now?

YEN: Not exactly. We seem to use a little force in what we need to do to meet certain criteria. In order to fit into this society, you have to get a bachelor's or a master's degree.

FRENCH: Bill, you've spoken several times about what you get in graduate school. Do you think this could be given in undergraduate school? Do you think it should be?

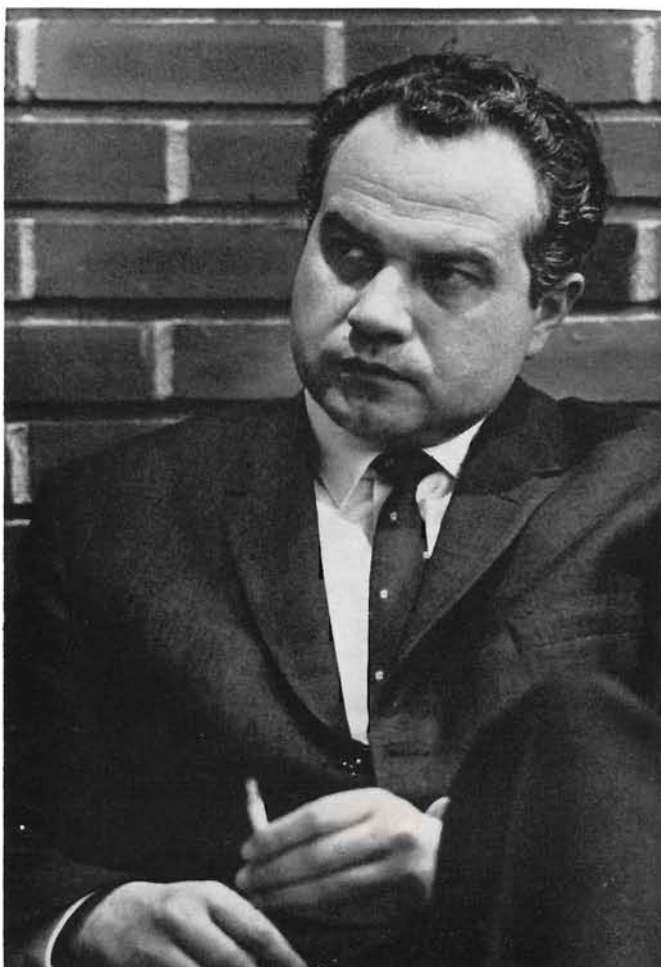
YEN: The University of Chicago has a program where a student spends an arbitrary amount of time trying to pass three courses and after that specializes. I think this would be a fine program. The courses are rather general: English, Western civilization, and a basic science course. You don't have to sign up for any units. Everything depends on passing three tests. After that you are eligible to specialize in a particular field. If a person is qualified to pass the tests immediately, he doesn't have to waste two or three years in required courses.

O'BRIEN: Would you recommend that kind of approach for Washington University?

YEN: I think it would be fine. If a person wanted a broader education, he could spend two or three years taking these general courses. If he wanted to go into some technical field, he could take the tests and get that stuff over with. In most instances, liberal arts courses are really a waste of time. I am interested in physics and want to spend all my time on that subject. However, if I develop an interest in philosophy, I think I would consider myself intelligent enough to pick up a book on philosophy and read about it without taking the full course.

BINNINGTON: I think you are talking about two levels of education—the person who wants to get into technical training and get it over with, and the person who wants a general education first—to dabble in a few fields and then specialize. I am going to get a master's in history before I go into medical school.

YEN: It's a critical age—16 to 20—because this is the time when one can really learn and not find it difficult.



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SERGEI IVANOV

At this moment, when I learn something new it's much more difficult than it used to be.

BINNINGTON: I feel that a somewhat greater amount of specialization is better, perhaps not in just one subject, but, say, spending one year studying two or three fields.

O'BRIEN: Do you think there is enough going on outside the classroom at Washington? Do you think the University provides enough opportunity for informal education?

FRENCH: Yes. The opportunity's there.

O'BRIEN: How would you define that? What opportunity?

FRENCH: Meeting the faculty, the Faculty Fellows program. We have Mr. Ridker of the Economics Department. I know nothing about economics, but this man is our Faculty Fellow; he's a wonderful person, and we talk about all kinds of things. He plans programs; we have little discussions at dinner. We eat dinner and everyone talks.

O'BRIEN: Do you think the faculty is close enough to the students? Do you think they ought to be closer?

YEN: That is a two-sided axe. I think it would be unfair to prominent research professors to waste their time on undergraduates. These people have work to do. Certainly there's a place where they have an interest in students, but it should not be demanded of them.

FRENCH: I don't agree at all. The physics professor is there to teach physics. If it's his office to teach, then he should certainly be with the students to teach them. But you're not advocating that there must be social intercourse between them, but something like the tutorial system. I think that's excellent.

KRIA: I think that the faculty is close enough to the students in comparison with faculties in other parts of the world.

BINNINGTON: One thing that the Liberal Arts College is trying to do are these seminars that I talked about, where you have eight or nine students for discussion. I understand that the faculty is going to try to expand these seminars for juniors and seniors, so that a student will be taking two or three seminars a semester in different fields. This is fairly close and detailed work with professors.

DAWES: As a member of Political Science I and II, I would like to say that the discussion groups are smaller than the lectures, but they do tend to be large groups of about 25 people. The student is not free just to put in an interesting remark or something from his outside reading. It's not a discussion.

BINNINGTON: It's much better to sit around in some sort of informal arrangement, smoking, drinking coffee, and talking. That is what the seminars do.

YEN: How much time would you propose the professors devote to this? The professor who has to do it in the seminar does it once a week.

BINNINGTON: But in seminars, the professor learns as much as the students. To conduct a seminar is quite different from teaching a bunch of freshmen.

KRIA: I hope Tunisia will take into consideration the importance of seminars and group discussions. I think it is the best way to confront teachers' and students' ideas.

O'BRIEN: One criticism of some American colleges is that there are great names on a faculty but the freshmen never see them. At Washington, we feel that this is not true. We feel that it is necessary to expose freshmen to the great minds in the various disciplines if they are to be attracted toward them, and we do have top-ranking professors teaching freshmen courses.

DAWES: I must say you meet people who are extremely clever, but the fact is you're treated like mud. The freshman is the lowest of the low.

POKU-KANKAM: Dr. Middlemiss was teaching us freshmen, and you just fall in love with such a professor, and with his subject. For such a great person to teach freshmen is psychologically important and helpful to the young students.

FRENCH: I think that maybe we should just demand a lot more of our freshmen and weed out the less intellectual students so that we could give top quality education to everybody. You've got to draw the line somewhere. You can't just give everybody an equal education, and time is of the essence.

O'BRIEN: That's another important question. Over the next decade and beyond, huge numbers of students will be seeking admission to colleges and universities. We can admit more students, but we don't want to become a great deal larger than we are now. So, what do we do? Do we keep narrowing entrance requirements until we admit only the top 5 per cent or top one per cent of the applicants, or do we try to maintain a broader cross-section?

FRENCH: But you get a cross-section even among the so-called intellectuals. You get all types of personality and character and background. There's no need to have a cross-section of intellect.

DAWES: Once you get the top 5 or one per cent or whatever it is, they'll be so proud of getting into this university that they'll really want to learn.

IVANOV: I am convinced that colleges in the foreseeable future will be transformed into real centers of developing technology and arts. These institutions of higher education will be equipped with modern facilities: movies, radio, television, on a large scale. Of course, it's difficult to predict what will happen to the cheer leaders and bonfires that students like. I personally like these customs of Amer-

ican students. If in our society and in your society, less time and energy will be spent on the production of material things, then more time will be devoted to the development of well-versed and creative persons to develop their gifts, talents, and inclinations in many fields—engineering, science, literature, and the arts.

O'BRIEN: To get back to Washington University. What would any of you change on the campus, if you could change it?

POKU-KANKAM: I lived in Liggett Hall. There were so many restrictions. There were no facilities to entertain visitors. If you knew some people were coming from the city to see you, you didn't have a place for them—which is very awkward.

DAWES: I must say I agree with you. I'm disappointed with the restrictions placed upon us. By the time a girl or a young man is 18, I think they should be allowed more freedom.

BINNINGTON: I wonder, just as a question, whether it would be good to start a seminar program for freshmen, rather than for juniors as it is now. Say a seminar in history rather than a big lecture on general Western civilization.

FRENCH: Yes, I can't see that one or two years makes that much difference. I think that maybe we should expect a great deal more of our freshmen and give them deeper, broader courses for the very best they can do.

DAWES: There is a difference between freshmen and juniors, because by the time you get to juniors the noisy freshmen and the freshmen who come to college for other reasons than wanting to learn have been weeded out.

BINNINGTON: If you increased the standards for admission and started a seminar program for freshmen, you would have to judge them on a somewhat lower basis than you judge upperclassmen. You learn different techniques in a university than you use in high school, and you have to have time to learn those techniques.

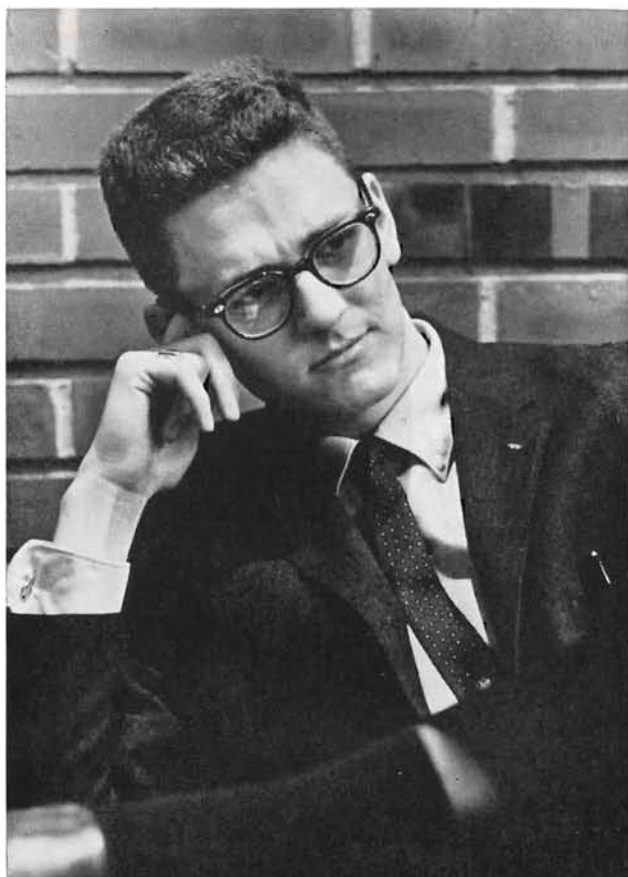
O'BRIEN: When the students celebrated Washington's Birthday party in the Quadrangle, one of the major themes of the skits was the complaint that the school is putting too much emphasis on academic matters. Do you agree?

BINNINGTON: One problem is that this year the standards for grading freshmen rose rather sharply, because the University was advertising this year's freshmen class as an outstanding one. When the grades came out so much lower than previous years, some people were frightened.

FRENCH: If the University demands a great deal more of students, then the students should be willing to give it.

O'BRIEN: There was also much talk of "apathy" on the campus. Do you think there is anything to this?

POKU-KANKAM: I think it is primarily the fraternities and sororities. If you're a member of a sorority or frater-



A student has to realize that he's at the university to learn and that his loyalty has to be toward that first. But there are places for secondary loyalties.

BRAD BINNINGTON

nity, you are subjected to one sort of social reaction and social grouping. Then, those who are not members of fraternities and sororities fall into different categories. That these groups are apathetic is only too true, to the disadvantage of both members and non-members.

FRENCH: Maybe I'm just an exception to the rule, but I'm one who was a member of a sorority and I'm not any more. As far as apathy goes, I am a great deal more apathetic toward campus functions now that I'm not in a sorority.

O'BRIEN: Do you think that there is a place for fraternities and sororities in the Washington University of tomorrow?

BINNINGTON: I think there's definitely a place for them. I'm a Greek myself, and I personally have learned a great deal. I have learned to get along better with people. This includes the concept of leadership, which I think is something the University has to develop, and normally it's not developed in academics, studying history or philosophy. This is one place where I think the Greek system has a strong place. Also, it provides people with like interests a way of getting together and working together.

DAWES: I think fraternities and sororities could be extremely useful in bringing out a team spirit. The school now is halfway between being academically minded and sports minded. And it's not a good halfway. It isn't balanced; they're not quite sure which way to turn.

YEN: May I say, as a former frat man, that I think there's no place in a really good university for these things, because they encourage narrow-mindedness. Leadership is a very abstract quality, and you really can't prove that fraternities develop leadership. You *can* see the prejudices and biases they develop.

POKU-KANKAM: It turns out to be something like a small brotherhood society. It is almost a closed society, of a primitive nature.

FRENCH: I think they are closed societies, too. That ties in with what we said earlier about the lack of communication. I'd like to add that, on a residence campus, there is absolutely no need for a Greek system. You should be free to choose friends of all kinds, and that's something you never get in a fraternity, no matter how good it is. You get one type of person, and nobody wants only one type of friend. I think everyone can use all kinds of friends; you are cutting yourself off from a great deal when you accept this closed society.

KRIA: I don't think there will be a place for fraternities and sororities in the Washington University of tomorrow. Students want friends that they like, not ones imposed upon them. Fraternities and sororities do not develop wide friendships.

KAMBHU: It depends on the size of the university you go to. If you go to a large university, you may need fra-

ternities. But with the size of Washington University, I don't think you need any fraternities at all.

DAWES: Even in a big university, if you're in a dormitory you have people across the hall, and there are little groups that can be formed easily.

KAMBHU: But your neighbor himself may take off and go to a fraternity, so what else can you do but join?

BINNINGTON: A student has to realize that he's at the university to learn and that his loyalty has to be toward that first. But there are places for secondary loyalties.

FRENCH: It would seem, perhaps, that Brad's idea of a seminar would bring the two loyalties together, because here you have a chance to develop social interest and secondary loyalties, and yet it would still be in an academic atmosphere.

DAWES: We don't want social life in an academic atmosphere.

FRENCH: But you have friends. You have communication with other people and yet you are still learning academically.

IVANOV: May I comment on your idea about seminars for freshmen? It seems to me a very good idea, but American students are not well prepared for it. In my country, students begin to study physics, biology, algebra, and history in the sixth grade. In the seventh grade, they study chemistry and geometry. They are better prepared for discussions and seminars. If freshman seminars could take place in American colleges they would be very valuable, but now it's impossible.

O'BRIEN: Another point I'd like to bring up is the question of the political awareness of American students compared with students of other countries. Do you think our students at Washington, or American students in general, feel any sense of involvement with the political world?

POKU-KANKAM: When you meet someone here and you say you come from another country, you often run into difficulty because of the other person's limited knowledge of your country. When I said I came from Ghana, someone said, "Is Ghana part of the Congo?" I didn't know what to say. International consciousness among American students is almost in oblivion. According to statistics, about 90 per cent of the people of the United States are not politically conscious, although about 10 per cent are very conscious and very active. At the university level, this is not so. You have about 50 or 60 per cent who aren't very interested. But you should know what country you are talking about and a little bit about other peoples.

KRIA: It seems to me that American students do not have open minds as far as the rest of the world is concerned. The only political subject students can talk about is the American-Russian conflict.

DAWES: I would say that a great many British students are more interested in what is going on now in Europe. It means more to us than what is going on between America and Russia. People can be very concerned only with what affects their own country directly.

BINNINGTON: I feel very definitely that the students I know are not sufficiently politically conscious. I think they should become politically conscious, because all too often they go off half-cocked. They don't know much about a subject and they make a judgment about it.

YEN: In the majority of the places of the world, the students are really a major political force. In South Korea, Japan, and Mexico, even the grammar school students hold demonstrations. In those places, the students are a political force that must be reckoned with, and from those student groups political leaders are developed.

In the United States, political leadership does not develop this way. It develops in smoke-filled back rooms.

DAWES: In Europe and in Latin America, students are extremely politically conscious, because that is the way they are trained to think. Students of the French, Spanish, and Italian universities play a great part in political life.

POKU-KANKAM: Here truck drivers who stop somewhere for coffee know more about American politics than students who are dedicated to history and humanities. If you make these contrasts, you see that there is something lacking. When a student is not interested in politics, then what do you expect of him? If he is not interested in the world around him, what do you expect of him? There must be something wrong.

FRENCH: I think American students don't have political consciousness, but they need it. What can we do about it? What can the University do other than require Political Science 101 and 102?

POKU-KANKAM: Well, perhaps treat the students a little more like adults. That might give them that sense of responsibility.

BINNINGTON: I think one way it could be done is by having more political discussions on an informal basis.

DAWES: And who would come to them? The same people who come to those things now.

BINNINGTON: You might still be able, using organizational procedures, to get more students. There is a possibility, though, that you wouldn't, because the American student knows that he is not a strong political force and has not been one traditionally.

POKU-KANKAM: A society that is moving depends more on the younger generation than the old. You need young men to go abroad and rub shoulders with other people. At Washington University, the students have something to give to their country. You cannot force them to do it; it's something that has to be developed.

Frank Groom Kirtz, AB 43, MS 44, LLB 46, entered Washington University when he was 14 years old and at 19 was teaching physics here. He also found time during his graduate student days to work on atomic bomb research for the Manhattan Project. His list of degrees includes, in addition to those from Washington, a PhD in chemistry from Johns Hopkins University.

Today, Mr. Kirtz is a patent attorney, with offices in St. Louis. Among his literary works is *The Law of Electrical Invention*, a 750-page technical reference book for electrical engineers, inventors, and patent attorneys.

Of his standing in the ever-growing company of Sherlock Holmes researchers, Mr. Kirtz writes:

"My interest in Holmes goes way back. It even predates the intellectual literary quiz set up in 1940 by Tennessee Williams' brother Dakin, when Dakin was editor of *Eliot* and was hanging around Ridgley Library. The quiz was posted at the entrance to the reference room and the first question was: 'Who lived at 221 Baker Street?' To get a perfect score in the quiz you were supposed to answer: 'Sherlock Holmes.' I got an argument when I answered: 'Mrs. Hudson,' which was obviously correct. She owned the house and Holmes lived upstairs at 221 B Baker Street."



Drawings by Chip Reay

THE STRANGE CASE OF JOHN H. WATSON, M.D., LATE INDIAN ARMY

By FRANK GROOM KIRTZ
AB 43, MS 44, LLB 46

A STUDY OF THE RELIABILITY OF WITNESSES
BY ONE OF THE BAKER STREET IRREGULARS

THIS PAPER IS A RESEARCH into the mind of one of history's greatest witnesses, Dr. John H. Watson, who formerly played rugby for Blackheath.¹ He was later an assistant surgeon attached to the Fifth Northumberland Fusiliers in the British Indian Army,² and then he found his rendezvous with destiny: He became the companion of Sherlock Holmes. The research is conducted entirely through the internal evidences of the so-called Canons, or Sacred Writings, those 60 tales of the world's most famous detective.

Watson may be considered a highly intelligent and trained witness. He can quote Horace philosophically at the end of "A Study in Scarlet." He was a medical graduate of the University of London³ and a graduate next at Netley of the course prescribed for surgeons in the British Army. His greatest training as a witness, of course, was his continuing association with Sherlock Holmes, the one man in all the world for whom attention to detail amounted to a passion. We shall look for inconsistencies, contradictions, and distortions in the testimony of Dr. Watson.

There is the question of Dr. Watson's wandering Jezail bullet. On the first page of his first writings⁴ he states that at the battle of Maiwand⁵ he "was struck on the shoulder by a Jezail bullet, which shattered the bone and grazed the subclavian artery." Contrariwise, on the third page of his next story⁶ he "sat nursing my wounded leg. I had had a Jezail bullet through it some time before, and though it did not prevent me from walking it ached wearily at every change of the weather." Let us remember that he was himself a British Army surgeon. Of course, we must notice that in the second situation he may have been confused by the wine he had been drinking or by exasperation. He says, "Yet upon that afternoon, whether it was the Beaune which I had taken with my lunch or the additional exasperation produced by the extreme deliberation of his manner,⁷ I suddenly felt that I could hold out no longer." Let us assume it was the wine. On another occasion Holmes describes Watson⁸ as a "half-pay officer with a damaged tendo Achillis." The Achilles tendon is, as everyone knows, not in the leg but in the heel. We prefer to accept Holmes's diagnosis of the position of the bullet, for he is the more expert witness, as Watson often points out.

We can see that Watson was not a simple man. He was a highly trained professional and a complex person, but as a witness, he left something to be desired.

There is the matter of the address. Watson made the lodgings he shared with Holmes, 221B Baker Street, famous. Literally thousands of searchers have looked in vain for that address. Watson surely cannot have negligently mistaken the address he mentioned so often. Undoubtedly he chose a fictitious number in order to avoid crowds of the curious. It remained for a St. Louis X-ray specialist to solve the problem.

The perfect clue was there for all to notice. Holmes was setting a trap⁹ for Colonel Sebastian Moran, formerly "the second most dangerous man in London," but since the death of his employer, Professor Moriarty, the latter's successor in the championship role. After a circuitous journey from Kensington where Watson was staying, Holmes and our witness Watson passed through a network of mews and stables, the very existence of which Watson had never known. They emerged in a small road, lined with old, gloomy houses, then into Manchester Street, and to Blandford Street. Here they turned down a narrow passage, passed through a wooden gate into a deserted yard, and went in the back door of a house. They went down a long hall and turned into a large empty room from which they could see across the street.

"Do you know where we are?" he (Holmes) whispered. "Surely that is Baker Street," I answered, staring through the dim window.

"Exactly. We are in Camden House, which stands opposite to our own old quarters."

In the 1920's Dr. Gray Chandler Briggs, on vacation in London, retraced their steps. He found and photographed Camden House. He actually found the name still on the building. It was then No. 118 Baker Street; the house across the street was No. 111.¹⁰

¹ "The Adventure of the Sussex Vampire"

² "A Study in Scarlet"

³ 1878

⁴ "A Study in Scarlet"

⁵ Afghanistan

⁶ "The Sign of the Four"

⁷ Holmes was in the act of taking a 7 per cent solution of cocaine.

⁸ "The Sign of the Four"

⁹ "The Adventure of the Empty House"

¹⁰ Dr. Briggs's photograph of No. 111 is in the book *Studies in Sherlock Holmes*, by Vincent Starrett. H. W. Bell in *Sherlock Holmes and Dr. Watson* disagrees with Briggs's conclusions. He points out that during the entire active career of Sherlock Holmes the building at No. 111 was known as No. 30 York Place. York Place, however, was a single block lying between Baker Street and Upper Baker Street, and the whole thoroughfare might be thought of as Baker Street. This would imply that Watson gave a dummy address for the sake of privacy.

Many men forget the exact date of their wedding anniversaries. Watson is confused even as to the year in which he married. "The Adventure of the Noble Bachelor" gives a clue. The second paragraph of the story begins with Watson's statement, "It was a few weeks before my own marriage." Now we can date this adventure precisely in October, 1887, for two reasons. The hotel bill in the story is dated October 4, and the year is 1887 because Lord St. Simon is described as being born in 1846 and being 41 years of age. So Watson thinks that he was married at the end of 1887.

We all remember, however, that at the end of "The Sign of the Four," Watson had won the heart and hand of Mary Morstan. It would be natural to assume that the marriage followed almost immediately. That would be about the month of August, 1888. The reasoning is as follows: When questioned about dates, Miss Morstan replied that her father "disappeared upon the third of December, 1878—nearly ten years ago."¹¹ But the date of the story can be deduced by another remark of Miss Morstan's, "about six years ago—to be exact, upon the fourth of May, 1882." So in "The Sign of the Four," Watson was apparently introduced to Mary Morstan, his future wife, on July 7, or 8, 1888,¹² and according to this story they must have been married toward the end of 1888.

More conflicting evidence is found in "A Scandal in Bohemia." Holmes and Doctor Watson had not seen each other for some months, in spite of the fact that the date of the story is stated to be March, 1888. As Watson says, "My marriage had drifted us away from each other." On the night of the twentieth of March, Watson, returning from a professional visit, saw the spare figure of the detective "pass twice in dark silhouette against the blind." We know that they were sharing lodgings on July 7-8, 1888, since that was the date on which Mary Morstan showed them the Sholto letter. This is all very strange.

In "The Study in Scarlet," Watson lists Holmes's characteristics; he describes the detective's knowledge of literature as "nil." Perhaps this is due to the fact that he has just quoted Thomas Carlyle, and Holmes has "inquired in the naivest way who he might be and what he had done." However, in "The Sign of the Four" Holmes compares Jean Paul (Richter) and Carlyle so succinctly that he must have been teasing Watson about Carlyle before. We have other examples of his knowledge of literature. In this same tale, he quotes Goethe twice (in German), quotes a French proverb, repeats a scrap of Latin, recommends Winwood Reade, and mentions several of his own monographs. Further examples of his literary sophistication include his purchase of *De Jure Inter Centes*, published in Latin in 1642,¹³ his allusions to Grimm's *Fairy Tales*,¹⁴ and his recognition of a quotation from Balzac in one of Hosmer Angel's letters.¹⁵ In "The Adventure of the Noble Bachelor" he quotes Thoreau's well-known remark on circumstantial

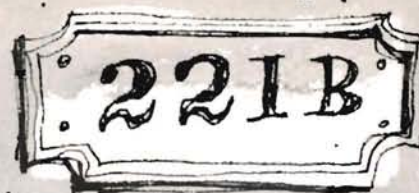
¹¹ "The Sign of the Four"

¹² *Ibid.* Miss Morstan brought with her a letter from Sholto, dated July 7, which she received "this morning."

¹³ "A Study in Scarlet"

¹⁴ "The Adventure of the Sussex Vampire"

¹⁵ "A Case of Identity"



evidence,¹⁶ and on other occasions he refers to Boswell¹⁷ and Darwin.¹⁸ Elsewhere he quotes Flaubert¹⁹ and compares Haifz with Horace.²⁰

In his study of Holmes's characteristics, Watson recalls that in the early days of their acquaintance Holmes's knowledge of astronomy was "nil." It happened in this way. "My surprise reached a climax, however, when I found incidentally that he was ignorant of the Copernican Theory and of the composition of the Solar System."²¹ By the time of "The Greek Interpreter," Holmes's knowledge must have increased: "It was after tea on a summer evening, and the conversation, which had roamed in a desultory, spasmodic fashion from golf clubs to the causes of the change in the obliquity of the ecliptic, came around at last to the question of atavism and hereditary aptitudes." The changes in the obliquity of the ecliptic are definitely part of astronomy. Then in "The Adventure of the Bruce-Partington Plans," Holmes is quoted as saying of his brother, "But that Mycroft should break out in this erratic fashion! A planet might as well leave its orbit." Apparently Holmes knew about the fixed character of planetary orbits. Perhaps Watson was being teased about the Copernican Theory, and being inattentive, was unaware of the situation.

Now as to Holmes's knowledge of the violin. In that famous list of characteristics²² Watson says that Holmes "plays the violin well." In the same story the detective drags Watson off to Halle's concert, after a triumphant morning of detection at Lauriston Gardens, saying: "And now for lunch, and then for Norman-Neruda."²³ Her attack and her bowing are splendid. What's that little thing of Chopin's she plays so magnificently: Tra-la-la-lira-lira-lay."²⁴ Watson forgot to record his answer.

Watson describes Holmes's powers upon the violin as "very remarkable, but as eccentric as all his other accomplishments."²⁵ After mentioning that he played difficult pieces, Watson goes on to describe the detective's unique method:

When left to himself, however, he would seldom produce any music or attempt any recognized air. Lean-

¹⁶ "Circumstantial evidence is occasionally very convincing, as when you find a trout in the milk."

¹⁷ "A Scandal in Bohemia"

¹⁸ "A Study in Scarlet"

¹⁹ "The Red-Headed League"

²⁰ "A Case of Identity"

²¹ "A Study in Scarlet"

²² *Ibid.*

²³ Wilhelmina Neruda (1839-1911) married Ludwig Norman in 1864.

²⁴ Scholars have suggested that it is the "Mazurka in E-Flat Minor, Op. 6, No. 4," transcribed for the violin in E minor.

²⁵ "A Study in Scarlet"

ing back in his armchair of an evening, he would close his eyes and scrape carelessly at the fiddle which was thrown across his knee. Sometimes the chords were sonorous and melancholy. Occasionally they were fantastic and cheerful. Clearly they reflected the thoughts which possessed him.²⁶

Now you can play sonorous and melancholy chords, or fantastic and cheerful chords, on a piano carelessly, but a violinist cannot produce chords on a violin that is lying carelessly across his knees. Chords on a violin are always a tour de force; they can only be played when the violin is gripped firmly in its accustomed position. The violin is the instrument of melody, not of harmony. Again Watson was not paying attention.

In Chapter 5 of "The Hound of the Baskervilles" we are given an example of an inexperienced witness obtruding an opinion: Watson says that Holmes "would talk of nothing but art, of which he had the crudest ideas." In Chapter 13, Holmes remarks of the Baskerville family collection, "Excuse the admiration of a connoisseur. . . . Watson won't allow that I know anything of art, but that is mere jealousy because our views upon the subject differ." He then proceeds to identify a Kneller and a Reynolds among the family portraits. As further proof of his interest in art, he recognized that Professor Moriarty owned a Greuze.²⁷

Now we must consider Professor Moriarty. Holmes said of him: "He is the Napoleon of crime, Watson. He is the organizer of half that is evil and of nearly all that is undetected in this great city. He is a genius, a philosopher, an abstract thinker. He has a brain of the first order."²⁸ With Professor Moriarty, we see some of the most shocking cases of Watson's memory lapses.

In one of the early cases, "at the end of the '80's," according to Watson, he records the description of Moriarty which Holmes gave to Inspector MacDonald: "The greatest schemer of all time, the organizer of every devilry, the controlling brain of the underworld, a brain which might have made or marred the destiny of nations—that's the man!"²⁹ Yet in "The Final Problem," which takes place in April and May of 1891, Watson states that he has never heard of Professor Moriarty.

Then there is the peculiar question of Professor Moriarty's first name. Mentioned only once in the stories,³⁰ it was James, Professor James Moriarty. This master criminal undoubtedly had a personality problem due to his first name, for he had a brother named James, Colonel James Moriarty.³¹ Since they were both named James, it was probably for psychological reasons that the Professor wrote a treatise on the Binomial Theorem in mathematics.

Watson goes further than this in his confusion about the brothers Moriarty, for he quotes Holmes as saying that the Professor has a younger brother who is a station master

in the west of England.³² Possibly Colonel James Moriarty was also the station master. We must doubt this, and we are troubled by the persistent speculation that the station master was a third brother, also named James.

Another peculiar example of Dr. Watson's testimony lies in the passage in which Holmes explains how he was able to escape from Professor Moriarty at the Reichenbach Fall:

We tottered together upon the brink of the fall. I have some knowledge, however, of baritsu, of the Japanese system of wrestling, which has more than once been very useful to me. I slipped through his grip, and he with a horrible scream kicked madly for a few seconds, and clawed the air with both hands. But for all his efforts he could not get his balance, and over he went.³³

This is all very illuminating except for the fact that there is no such word in Japanese as "baritsu," or rather there was none at the time.³⁴ The Japanese word "jūjitsu" may be the system of wrestling referred to; it may be spelled in a variety of ways, but none of them remotely resembles "baritsu."

An absolutely unforgivable case of Watson's bumbling dates lies in the first paragraph of "The Adventure of Wisteria Lodge." "I find it recorded in my notebook," Watson begins, "that it was a bleak and windy day towards the end of March in the year 1892. Holmes had received a telegram whilst we sat at lunch, and he had scribbled a reply. . . . Suddenly he turned upon me with a mischievous twinkle in his eyes." But during 1892 Holmes was missing and believed to be dead. His absence dates from May 4, 1891, to April, 1894, the year of Ronald Adair's inexplicable murder.³⁵ Actually he had been traveling, he explained,³⁶ in Tibet as the Norwegian explorer Sigerson, and then had done research into the coal-tar derivatives at Montpellier, in the south of France.

Let us hope that there is not a final fatal note in that passage in which Watson describes the disposition of his unpublished papers which abound in material for stories:

Somewhere in the vaults of the bank of Cox and Co., at Charing Cross, there is a travel-worn and battered tin dispatch-box with my name, John H. Watson, M.D., Late Indian Army, painted upon the lid. It is crammed with papers, nearly all of which are records of cases to illustrate the curious problems which Mr. Sherlock Holmes had at times to examine.³⁷

Watson sounds unsure of just where he had left this treasure. It would be indeed unfortunate if he has had another lapse of memory. For with Holmes retired to his bee farm on Sussex Downs and Conan Doyle dead, Watson, with all his faults, is our only possible source of future stories. Let us not despair, however, since both he and Sherlock are immortal.

²⁶ *Ibid.*

²⁷ "The Valley of Fear." A significant fact, as the picture is

worth 40,000 pounds, whereas Moriarty's legitimate income was only 700 a year.

²⁸ "The Final Problem"

²⁹ "The Valley of Fear"

³⁰ "The Adventure of the Empty House"

³¹ "The Final Problem"

³² *Ibid.*

³³ "The Problem of Thor Bridge"

³⁴ "The Valley of Fear"

³⁵ "The Adventure of the Empty House"

³⁶ *Ibid.*

³⁷ "The Problem of Thor Bridge"

Comment / The Washington University of Tomorrow

THE SPECIAL 16-PAGE NATIONAL REPORT ON "The College of Tomorrow" in this issue was prepared by Editorial Projects for Education, Incorporated, a non-profit organization of representatives of 22 colleges and universities, including Washington University.

An enormous amount of time and effort went into preparation of the project. It is packed with vital statistics and pertinent data gleaned from literally tons of interviews, questionnaires, studies, and reports. It represents the considered and carefully weighed opinion of a group of qualified experts on the probable trend of future events in the educational world. Whether the predictions so painstakingly made will turn out to be accurate or completely haywire only time can tell.

How much of what the editors of this special report have to say can be applied to Washington University? Are the facts pertinent to our individual situation? Can we profit from their findings?

Obviously, many of the developments the editors predict will apply to all American colleges and universities. We are all facing the same major problems: the mushrooming growth in college-age youth; the urgent need to find qualified teachers; the accumulating pressures from government, business, and the community; above all, the constantly accelerating need for money—and lots of it.

In addition, Washington University faces a few problems all its own. This is a private university, an urban university, a Midwestern university, and a university with unlimited scholastic ambition. Our college of tomorrow will depend not only on how we meet the national problems, but also on how we cope in future years with these particular and very special problems.

Most attempts at foreseeing the future fall comically short of what really comes to pass. Back in 1848, Edgar Allan Poe attempted to portray the world a thousand years in the future in a short tale called "Mellonta Tauta." Despite one of the most over-heated imaginations in literary history, the most far-fetched development Mr. Poe could envision for the year 2848 was a trans-Atlantic balloon with a top speed of 100 miles an hour.

The attempt of our experts to predict the college of tomorrow may seem just as ludicrous some day. The future has always turned out to be full of surprises. All we can hope to do is try to guess at probabilities; the possibilities are endless.

The Washington University of tomorrow may turn out to be a radioactive slag heap. It may end up an academic prison in which the Official Truth is handed down to a brainwashed corps of automatons. On the other hand, the Washington University of tomorrow could be, and we

hope will be, a vigorous and exciting center of teaching, research, and scholarly pursuit. It should be the ever-expanding nucleus of intellect and culture in a revitalized community. It could become the true university all of us are trying to make it become.

During the past 15 years, Washington University has changed more profoundly than it had over the preceding 90 years of its history. During those 15 years, the groundwork has been laid, the plans drawn, and the momentum generated for the years of building that lie ahead.

What our college of tomorrow will be like depends primarily on what we do over the next 15 years. If we all work to maintain the spirit of inquiry and the search for knowledge that is the true business of the university, our college of tomorrow can be anything we care to make it.

An excellent start on building the college of tomorrow was made when Thomas H. Eliot was named to become the new chancellor. The selection of Arthur Holly Compton to head the University in 1945 ushered in a new era, and the choice of Ethan A. H. Shepley to succeed him insured the continuation of the Compton renaissance. Thomas Hopkinson Eliot should prove to be a chancellor in the same great tradition.

MR. ELIOT will be the third chancellor in Washington University's history whose original training was in the law. He shares this background with Ethan Shepley and with Herbert Spencer Hadley, who was chancellor from 1923 to 1927.

The other nine chancellors in the University's 109-year history present a wide variety of backgrounds. Three were trained in the classics: Joseph Gibson Hoyt, Frederic Aldin Hall, and George Reeves Throop. William Greenleaf Eliot was a theologian, William Chauvenet a mathematician, Winfield Scott Chaplin a civil engineer, and David Franklin Houston a political scientist. Two were scientists: Arthur Holly Compton in physics and Carl Tolman in geology.

Regardless of his original field, each man brought to the job of chancellor a whole-hearted commitment and a determination to put all his talents and energies to the service of the University.

Tom Eliot brings training not only in law but also in political science, in government, in teaching, in statesmanship. All of these talents, we are sure, will be applied to the job of building the Washington University of tomorrow.

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